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NOTES ON THE PREPARATION OF ARSENIC TRIBROMIDE AND ITS ADMINISTRATION.

By Frank L. Slocum.

As the preparation of arsenious bromide ($AsBr_3$), and more especially its supposed aqueous solution for administration, as given by R. F. Fairthorne,[1] is wrong, and may lead to very erroneous conclusions on the physiological action of $AsBr_3$, a correction on such a delicate compound is thought to not be out of place here.

$AsBr_3$ was prepared by J. Nicklès in 1859.[2] He gave complete directions for its preparation in 1862,[3] as follows: To one part bromine, dissolved in two parts of carbon disulphide, finely powdered metallic arsenic is added in small quantities, each time shaking till dissolved. This is continued until no further decoloration takes place, when the solution is immediately filtered and allowed to crystallize. Pure $AsBr_3$ forms colorless hygroscopic crystals, having the specific gravity 3·66 (Boedecker);[4] melting point, 20° to 25°C.; boiling point, 220°C. It distils without decomposition and sublimes in crystals.

The precaution to be used in this method is to have the bromine and carbon disulphide perfectly dry. We know that commercial bromine contains water, chlorine, iodine, tetrabromide of carbon and, undoubtedly, bromoform. The presence of these last two are probably what gave Mr. Fairthorne's aqueous preparation its smell of chloral. Further, commercial arsenic contains at least arsenious anhydride (As_2O_3) and a sub-oxide (As_2O?). Each of these impurities by Mr. Fairthorne's process leads to a product of a different composition than $AsBr_3$, as we will see farther on, and also gives a finished product which must invariably contain either an excess of free bromine or

[1] "Am. Jour. Phar," 1883, p. 143.
[2] "Compt. Rend.," 48, p. 837.
[3] "Jour. Phar. et Chim." [3], 41, p. 142.
[4] "Jahresbericht Chem.," 1860, p. 17.

arsenic. $AsBr_3$ is not volatile at ordinary temperatures, as it is a solid. The conclusion was probably drawn from having an excess of bromine in solution. Of course the crystallized compound would fume in moist air, but would only give off hydrobromic acid gas.

The striking similarity of the halogen compounds of the group of metals to which arsenic belongs, and their peculiar decomposition with water, leads us at once to infer that an aqueous solution of $AsBr_3$ is an impossibility.

Wallace, in 1859,[1] showed that arsenious anhydride was very soluble in melted $AsBr_3$; that one part $AsBr_3$, dissolved in three parts boiling water and allowed to cool, gave crystals of pure arsenious anhydride; that $AsBr_3$ boiled with a large amount of water containing hydrobromic acid, an insoluble precipitate was formed; that the same was arsenious dibromide (AsOBr); that if $AsBr_3$ was dissolved in cold water containing a large amount of hydrobromic acid, and the solution allowed to evaporate without heating, crystals of $AsOBr + 3H_2O$ were formed. Further, if $AsBr_3$ was dissolved in a similar strongly acid solution, by boiling, and evaporated to crystallization, it gave crystals of $2AsOBr.3As_2O_3 + (24H_2O)$. Then Nicklès[2] verified these results in a great measure by his parallel researches on the action of water on AsI_3. Serullas[3] conclusively proved that $AsBr_3$, dissolved in a large amount of water, was entirely decomposed into arsenious anhydride and hydrobromic acid, and when dissolved in the least possible amount of water gave AsOBr and hydrobromic acid. From the above we see that the solution of $AsBr_3$, as prepared by Mr. Fairthorne, is nothing but a weak hydrobromic acid solution of arsenious anhydride, and, further, that an aqueous solution of $AsBr_3$ is impossible.

The question is, how to administer $AsBr_3$ as such, and whether it is beneficial to introduce such a strong oxidizing substance into the stomach. Undoubtedly not, for the immediate violent chemical reaction, which must follow when $AsBr_3$ is brought in contact with the liquids of the stomach or the tissues, could only produce a strong caustic action. If there is medicinal virtue in the haloid compounds of arsenic, the writer believes it must lie in the oxy-compounds AsOBr or AsOI. These are easily prepared by the methods given above, and

[1] "Phil. Mag." [4], 17, p. 261.
[2] "Jour. Phar. et Chim." [3], 36, p. 161.
[3] "Schw. Jour.," 55, p. 345.

their farther decomposition when introduced into the stomach will be mild and of a different character than that of $AsBr_3$ or AsI_3. These conclusions are strengthened by the fact that we already have valuable oxy-compounds of the metals of this group; and, further, there seems to be no ground for introducing into the stomach an oxidizing and disinfecting compound whose action is similar but stronger than pure bromine or iodine.

Strassburg, Germany, March 24, 1883.

NOTE BY THE EDITOR.—Arsenious bromide was first prepared and described by Serullas, in 1828 ("Annales de Chimie et de Physique," xxxviii, 318); it was obtained by gradually adding powdered arsenic to bromine contained in a tubulated retort, and finally distilling. Serullas also determined the crystalline and hygroscopic nature of the compound, its melting point, boiling point, volatilty and decomposition by water, as given in the above paper. Nicklès, in 1862 (*loc. cit.*, foot note 3 on page 225), states that the compound has a strong arsenical odor.

CALCIUM IODIDE.

BY R. ROTHER.

The business of pharmacy in its progressive phase must, from necessity conform with the general law of development. But this law does not determine a uniform rate or course which may be represented by either a straight line or a definite curve. Were all bodies equally elastic they would uniformly repel each other and there could consequently be no crowding or integration. The elasticity, however, is not equal, and hence plasticity arises as a differential product. Elasticity is, therefore, the conserving element and plasticity the moulding element. They are the primordial factors of development, whose interaction as heridity and adaptation determine the line of descent. Differentiation is the consequence of following the line of least resistance. It presumes the liberation of a corresponding amount of force and is, therefore, a limited phase of disintegration. When at last the integration becomes excessive and differentiation is impossible from lack of mobility, the increasing stress overcomes the elasticity of the least resistant of the crowded moving equilibria, and the force thus made available determines a revival of the differentiation. This makes it evident that the course of development is rhythmic in its nature, and that although inte-

gration induces concomitant differentiation, extreme integration causes differentiation indirectly by the destruction of the least co-ordinated equilibria. This action is most clearly represented by the curve called the parabola. The ascending branch as it nears the focus shows the progressive integration and consequent differentiation which reaches its climax at the axis of the curve. Disintegration now takes place and a period of dissolution intervenes, which is represented by the descending branch. The liberated force now determines an ascent, and integration again proceeds as before, with a renewed and still higher phase of development. The parabolas of all orders of development unite and thus constitute the great parabola of development at large.

In pharmacy the increasing integration and multiplication of interests and their conflicting competition soon effects a specialization which throws open new fields for development. Each branch repeats the process within its own sphere and further adds fresh lines of progress. Excessive competition among all or any of these will cause the weaker to succumb and transfer the unlocked means and energy to the survivors who, thus being reinforced, carry their own temporarily impeded development to still greater perfection. When the duties of the pharmacist become too numerous and pressing for immediate supervision they are dropped, one by one, and transferred to other hands not in direct contact with the business. His retained activities become gradually more circumscribed and incidentally more perfected through this division of labor. The earliest to separate are the trading and producing branches. Whilst the producing function is thus segregated its development is also enhanced, and its specialization and consequent efficiency becomes so great that the trading pharmacist can no longer compete even in the remotest with it, either in perfection or reduced cost of the product.

The new Pharmacopœia has emphatically recognized this important fact, and arranged its own construction accordingly. It is, to say the least, highly creditable to this work that the fabrication of a vast multitude of chemical products, especially, has been relegated to the proper function. The modern pharmacist has assumed a new attitude in this relation, and the Pharmacopœia has again wisely recognized it by its elaboration of the standards to which the official products should attain. This requires a higher theoretical training in pharmacy than ever before, and although manipulative skill is by no means permitted to deteriorate, its application is only changed.

As there are always new medicinal agents coming into use which are not often found in the market until the demand becomes quite general, the pharmacist is occasionally called upon to exercise the primitive function of preparing compounds obtainable in no other way. For such and similar cases only, the Pharmacopœia gives processes, in connection with those that are pre-eminently pharmacopœial. These are, however, rapidly improved in most cases, so that the early official method is not always the best after a ten years' period of general progress.

Calcium iodide is one of those compounds occasionally called for, which is not generally kept nor very easily prepared in a proper form. When caustic lime is triturated with iodine, a peculiar black combination is obtained in which chemical union of some kind is exerted. Similar compounds are produced when dry iodides are mixed with iodine in a like manner. Some of these bodies are soluble in alcohol, and then yield crystals of definite superiodide even of the monad metals. Water decomposes them, however, with the liberation of iodine. On boiling the black calcium oxide and iodine compound with water, a colorless solution of calcium iodide and iodate is obtained, whilst the excess of lime remains as hydrate. There is no convenient way of separating these salts, neither is the reduction of the attendant iodate practicable. Hence this process does not answer for the preparation of calcium iodide.

Calcium iodide may be prepared by dissolving calcium hydrate, or better, carbonate in iodhydric acid. The difficulty in this case is the preparation of the acid by a practical and convenient method, which so far has not been found. The usual process for preparing calcium iodide consists in decomposing ferrous iodide or ferric iodide with calcium hydrate. In the first instance the iron is precipitated as ferrous hydrate, and in the second as ferric oxy-hydrate. Both precipitates are excessively bulky, and require much washing to secure all of the generated calcium iodide. A correspondingly large volume of water will then have to be evaporated.

The process which embodies the most advantage, consists in decomposing ferric iodide with calcium carbonate. In this case the iron is precipitated as the compact nongelatinous ferric hydrocarbonate, according to the following reaction:

$$2(FeI_3) + 3(CaCO_3) + 2(OH_2) = 3(CaI_2) + Fe_2CO_3(OH)_4 + 2(CO_2).$$

A very concentrated solution of calcium iodide is thus obtained,

which cannot be properly filtered through paper in an undiluted condition. Its destructive action upon the paper results in soluble colored products, which interfere with the whiteness of the dried salt. The affinity of calcium iodide for water is so great that when a very concentrated solution of it is mixed with an equally strong solution of dipotassic carbonate, no double decomposition occurs, but the potassic carbonate separates as a gelatinous magma. No calcium carbonate results until more water is added, when the calcium is immediately thrown down as white carbonate.

The calcium iodide on evaporation of its solution is obtained as a white or colorless crystalline salt containing water. The solution must be concentrated until a dense pellicle forms over the surface. The fused mass is then poured on a smooth surface and well-covered to prevent deliquescence. On cooling, the salt is readily detached in large fragments. These may then be broken into smaller pieces and preserved in well-stopped bottles. Large, shallow capsules or ordinary dinner plates with bright smooth surfaces, are the most suitable vessels for cooling the fused salt. During this part of the operation it is essential that moist air be excluded to prevent deliquescence. For this reason the salt is best dried under a bell-glass over sulphuric acid.

In the preparation of calcium iodide the use of iron filings is not admissible, because of the large amount and the peculiar form of the carbon contained in them. In this instance, a yellow organic acid is generated, which yields colorless ferrous salts and orange ferric salts not precipitable by calcium carbonate, but decomposable by a calcium hydrate. The resulting calcium salt of this acid is also orange tinted, but is destroyed on fusion of the iodide, the carbonaceous residue imparting to this a greyish, unsightly appearance. Re-solution of the fused mass and filtration of the solution now produces a colorless salt. Iron wire also contains some carbon, but in a different state of combination, so that none of the peculiar acid is produced. With its use the iron is wholly precipitated by calcium carbonate, even in the presence of excess of iodine, and a white salt is directly obtained on evaporation. The contact of organic matter must, however, be carefully prevented in the manipulation, and the filtration of a too concentrated solution through paper must be avoided.

From these considerations, the following formula is derived:

Iron in fine wire, . . .	56 parts.
Iodine, ...	381 "
Calcium carbonate, . . .	150 "
Water sufficient.	

Mix 56 parts or any moderate excess of iron wire with 1200 parts of water and 254 parts of iodine gradually added. When the reaction is completed and a light green solution is obtained, filter this and add to it the remainder of the iodine. Then, when this has all dissolved with the formation of a brown red solution, add the calcium carbonate (150 to 160 parts) by degrees, and warm the mixture when the effervescence slackens, until the evolution of gas has ceased and all the iron is precipitated. Let the dense precipitate subside and decant the supernatant liquid. Mix the residue with enough water to restore the original weight; let subside, and again decant. Mix the two decantates, pour the solution upon a filter, and when all has passed through, pour the sediment into the filter and wash it with water until practically free from calcium iodide. Unite all the filtrates and evaporate the mixture until a dense pellicle forms over the surface and boiling continues only at a narrow vent. Now pour the fused salt into a shallow plate of suitable size, cover it well, and when cooled, detach the hardened mass, break it up and preserve it in well-stopped bottles.

NOTE ON TINCTURA IODI.

By Henry C. C. Maisch.

Read at the Pharmaceutical Meeting, April 17.

Four samples of the tincture were prepared, using the proportions directed by the U. S. Pharmacopœia, 1880. For two of the samples alcohol, U. S. P., 1880, was used; the other two were made with absolute alcohol. To one of the samples made with each kind of alcohol, table salt was added equal to one-half the weight of the iodine used. The ingredients were put into stoppered bottles, which were agitated at intervals of about half an hour.

Three hours after the experiments were begun the iodine in the specimen prepared with absolute alcohol was nearly dissolved, and was completely dissolved one and a half hour afterwards. The iodine in the specimen made with absolute alcohol, to which chloride of sodium had been added, was dissolved in three hours.

The samples made with alcohol, U. S. P., took a longer time to dissolve; the one to which the sodium chloride had been added was finished in seven hours, but the one to which no salt had been added required one day to produce a perfect solution.

Ten grammes of the tinctures prepared with sodium chloride were

evaporated over a sand-bath, the residue from the tincture made with absolute alcohol weighing 0·1 gm., and from the other 0·15 gm. Each residue was dissolved in distilled water, and the solutions were treated with chlorine gas; in neither solution could iodine be detected by starch or carbon bisulphide. Both residues, amounting to 1·0 and 1·5 per cent., respectively, consist mainly of chloride of sodium; their solutions in distilled water, on being tested with nitrate of silver, yielded a copious precipitate, which was soluble in ammonia.

On evaporating 5 gm. of the tincture made with absolute alcohol alone, merely a trace of residue was obtained.

It seems as if the addition of salt in the preparation of this tincture aids the solution of the iodine only mechanically, and that a compound of sodium and iodine is not formed.

NOTE ON UNGUENTUM HYDRARGYRI NITRATIS.

By Henry C. C. Maisch.

Read at the Pharmaceutical Meeting, April 17th.

The ointment was prepared according to the formula published in the "American Journal of Pharmacy," March, 1883, page 145. The lard and neat's foot oil were heated together until the thermometer registered between 150° and 160° F., when the lamp was removed, but the temperature continued to rise until the mercury stood between 190° and 200° F. When the mixed fats had cooled down to 170° the camphor was dissolved therein, and soon after the mercury previously dissolved in the nitric acid was added, no effervescence being observed. The mixture was then stirred with a horn spatula while cooling, yielding an ointment of a yellow color, which in two days darkened considerably, even without bringing it in contact with an iron spatula. A portion of this ointment was stirred with an iron spatula when it became rapidly dark colored.

To be certain whether or not the previous heating of the fats had any effect on the ointment, another quantity of the ointment was made, the melted fats being kept in a waterbath at a temperature not exceeding 170° F. After the addition of the camphor, followed by that of the solution of mercury in the nitric acid, a slight effervescence was observed. A portion of this ointment, worked with an iron spatula, was affected in a similar manner as in the preceding experiment, while that portion in the preparation of which a horn spatula was used, retained its yellow color.

FLUID EXTRACTS OF THE NEW PHARMACOPŒIA.

By Alonzo Robbins.

Read at the Pharmaceutical Meeting, March 20.

(Concluded from page 188.)

Extractum Senegæ Fluidum.—*Fluid Extract of Senega.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs a menstruum composed of two parts of alcohol and one part of water, and adds two per cent. of water of ammonia to the fluid extract. The Philadelphia College of Pharmacy recommended diluted alcohol, with two per cent. of water of ammonia in the first one hundred parts of menstruum; a sample thus prepared in January, 1880, is now entirely without deposit, but there is on the top of the preparation a layer of mucilaginous matter, nearly a quarter of an inch deep in a four-ounce bottle, otherwise the fluid extract is in very good condition. The stronger officinal menstruum is probably the best for this preparation, and the addition of the water of ammonia to the finished fluid extract, instead of putting it into the menstruum, is a decided improvement, although perhaps an insufficient quantity is employed, five per cent. would more surely accomplish the object of its use.

Extractum Sennæ Fluidum.—*Fluid Extract of Senna.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, four fluidounces of glycerin, and four fluidounces of water, finishing the percolation with diluted alcohol, and adding four fluidounces of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs a mixture of three parts of alcohol and four parts of water; this, as mentioned, when considering fluid extract of ergot, is only a very little weaker than diluted alcohol. The Philadelphia College of Pharmacy recommended diluted alcohol as the menstruum; a sample thus prepared in January, 1880, now contains only a very slight precipitate, but there is a considerable deposit of a black substance on the sides of the bottle, otherwise the fluid extract is in good condition; as the menstruum used in the preparation of this sample, was so near the strength of the officinal, it is highly probable that the product of that menstruum would

not keep any better. With the object of ascertaining if a weaker alcohol would not answer the purpose, a number of experiments were made with a menstruum composed of one part of alcohol and two parts of water alone, and with various percentages of glycerin; while these menstruums exhausted the senna readily, the fluid extracts prepared with them precipitated very much, the glycerin not having the slightest effect in preventing this result; glycerin does, however, appear to cause all the separated matter to collect on the bottom of the bottle, and not adhere to the sides. Therefore it seems probable that diluted alcohol, with five or ten per cent. of glycerin in the first one hundred parts, would be the best menstruum for this preparation.

EXTRACTUM SERPENTARIÆ FLUIDUM.—*Fluid Extract of Serpentaria.*—For this preparation the Pharmacopœia of 1870 directed alcohol, the present Pharmacopœia directs three parts of alcohol and one part of water, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in November, 1879, now contains a slight granular precipitate and a very thin coating of similar granules on the sides of the bottle; in all other respects the fluid extract appears to be unchanged.

EXTRACTUM SPIGELIÆ FLUIDUM.—*Fluid Extract of Spigelia.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, four fluidounces of glycerin, and four fluidounces of water, finishing the percolation with diluted alcohol, and adding four fluidounces of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs diluted alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in October, 1879, now contains only a very slight precipitate and has undergone no apparent change whatever.

EXTRACTUM STILLINGIÆ FLUIDUM.—*Fluid Extract of Stillingia.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of twelve fluidounces of alcohol, three fluidounces of glycerin, and one fluidounce of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs diluted alcohol, the Philadelphia College of Pharmacy recommended three parts of alcohol and one part of water, as the menstruum; a sample thus prepared in December, 1879, now contains only a moderate precipitate, and in every other respect is in most excellent condition; another

sample made at the same time as the first, with diluted alcohol, has likewise only a moderate precipitate, but there is on the sides of the bottle, above the fluid extract, a considerable coating of yellowish substance; in other respects this sample is in moderately good condition, but the stronger menstruum is evidently the best for this preparation.

EXTRACTUM STRAMONII FLUIDUM.—*Fluid Extract of Stramonium.* This is one of the eleven fluid extracts added to the list by the Committee of Revision; it is directed to be made from the powdered stramonium seed with a menstruum composed of three parts of alcohol and one part of water; the product no doubt well represents the drug, but having this preparation, the officinal tincture of stramonium appears to be entirely superfluous, and if the same menstruum had been directed, the solid extract might have been very conveniently obtained from the fluid.

EXTRACTUM TARAXACI FLUIDUM.—*Fluid Extract of Taraxacum.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs two parts of alcohol and three parts of water, and the Philadelphia College of Pharmacy recommended the same menstruum, with ten per cent. of glycerin in the first one hundred parts. A sample thus prepared in January, 1880, now contains only a very slight precipitate, and is in all other respects in most excellent condition; two other samples were recently prepared, one the same as the above, and the other with the officinal menstruum; the first has undergone no change whatever, the second contains a slight flocculent precipitate, but if no further change occurs it will be evident that glycerin serves no useful purpose in this preparation.

EXTRACTUM TRITICI FLUIDUM.—*Fluid Extract of Triticum.*—For this newly-introduced preparation the Pharmacopœia directs one hundred grammes of finely-cut triticum, to be percolated with boiling water until it is exhausted; the percolate is to be evaporated to eighty cubic centimeters, to which is to be added twenty cubic centimeters of alcohol, and then after being set aside for forty-eight hours, it is to be filtered, and to the filtrate is added enough of a mixture of four parts of water and one part of alcohol to make the fluid extract measure one hundred cubic centimeters. The Phila-

delphia College of Pharmacy recommended the following process: add to one hundred parts of triticum three hundred parts of boiling water, and digest in a covered vessel for five hours; then strain off the infusion, pack the triticum in a percolator, and add, first the infusion and then boiling water, until the triticum is exhausted; evaporate the percolate to eighty-five parts, and when cool, add fifteen parts of alcohol; a sample thus made in January, 1880, now contains only a moderate precipitate, and appears to have undergone no change whatever. Another sample, containing no alcohol, was prepared at the same time as the first, by adding thirty parts of glycerin to the percolate and evaporating the whole to one hundred parts; this now contains about five times as much precipitated matter as the other sample.

EXTRACTUM UVÆ URSI FLUIDUM.—*Fluid Extract of Uva Ursi.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs diluted alcohol, with ten per cent. of glycerin in the first one hundred parts; the Philadelphia College of Pharmacy recommended a menstruum composed of one part of alcohol and two parts of water, with twenty per cent. of glycerin in the first one hundred parts; a sample thus prepared in November, 1879, now contains only a moderate precipitate, and is in every other respect in good condition; as this sample has kept so well, the use of the stronger officinal menstruum appears to be unnecessary.

EXTRACTUM VALERIANÆ FLUIDUM.—*Fluid Extract of Valerian.*—For this preparation the Pharmacopœia of 1870 directed stronger alcohol. The present Pharmacopœia directs a menstruum composed of two parts of alcohol and one part of water, and the Philadelphia College of Pharmacy recommended the same; a sample thus prepared in August, 1879, is now in good condition, containing only a small precipitate and a very slight deposit of separated matter on the sides of the bottle above the fluid extract.

The present officinal menstruum has been thoroughly tried, and the product proved to be, in many respects, superior to the product of that formerly officinal.

EXTRACTUM VERATRI VIRIDIS FLUIDUM.—*Fluid Extract of Veratrum Viride.*—For this preparation the Pharmacopœia of 1870

directed stronger alcohol; the present Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in December, 1879, now contains only a very slight precipitate, and appears to have undergone no change whatever.

Having this fluid extract, it seems superfluous to have also an officinal tincture of half its strength.

EXTRACTUM VIBURNI FLUIDUM.—*Fluid Extract of Viburnum.*—This newly-introduced fluid extract is one of the eleven added to the list by the Committee of Revision. The Pharmacopœia directs a menstruum composed of two parts of alcohol and one part of water; a sample prepared in August, 1880, with diluted alcohol, now contains a considerable deposit and a thin coating on the sides of the bottle, but the fluid extract is still of a deep red color, and transparent in thin layers; the stronger officinal menstruum is no doubt the best for this preparation.

EXTRACTUM XANTHOXYLI FLUIDUM.—*Fluid Extract of Xanthoxylum.*—For this newly-introduced preparation the Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended two parts of alcohol and one part of water, as the menstruum; a sample thus prepared in December, 1879, remains in good condition, except that a considerable quantity of a crystalline deposit has formed, which may be readily redissolved by placing the bottle for a few minutes in warm water; a change of menstruum is evidently required, but that it need be alcohol, or even that it need be as strong as the one used for this sample, continued experiment only can decide.

EXTRACTUM ZINGIBERIS FLUIDUM.—*Fluid Extract of Ginger.*—For this preparation the Pharmacopœia of 1870 directed alcohol (s.g. ·835). The present Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; samples thus prepared in November, 1879, with Jamaica and African ginger, remain at present with only a very slight deposit, and are apparently unchanged.

Having now noticed the entire list of officinal fluid extracts, a brief review will be given of the ten rejected from the list recommended by the Philadelphia College of Pharmacy; the first of these is,

EXTRACTUM ANTHEMIDIS FLUIDUM.—*Fluid Extract of Chamomile.*—For this preparation a menstruum composed of one part of alcohol and two parts of water was recommended. A sample thus

prepared in November, 1879, now contains a considerable precipitate; another sample, prepared at the same time, with one part of alcohol and three parts of water, now contains less than half as much precipitate as the first, in all other respects both samples are in excellent condition.

EXTRACTUM ASARI FLUIDUM.—*Fluid Extract of Wild Ginger.*—Alcohol was recommended as the menstruum for this preparation; a sample thus prepared in January, 1880, is now entirely without precipitate, and is in every respect in most excellent condition; another sample prepared about the same time, with a menstruum of three parts of alcohol and one part of water, now contains a considerable deposit of soft resinous matter, which cannot be again dissolved in the fluid extract by shaking. Alcohol is evidently the proper menstruum for this preparation.

The Committee of Revision not only rejected this preparation, but also dismissed asarum from the Pharmacopœia. This is to be regretted, for although the article may have had only a very limited employment by physicians, it is considerably used in general pharmacy.

EXTRACTUM AURANTII DULCIS CORTICIS FLUIDUM.—*Fluid Extract of Sweet Orange Peel.*—This was recommended to be made from the recently dried, yellow portion of the peel of sweet oranges, using alcohol as the menstruum; a sample thus prepared in January, 1880, now contains a very slight resinous deposit, and the flavor is also slightly deteriorated, but the preparation kept for nearly two years without perceptible change. If the percolation was allowed to proceed slowly, and occasionally stopped altogether for some hours, the orange peel would be exhausted before one hundred parts of percolate would be obtained, thereby avoiding the necessity for evaporation, and its doubtless injurious effect on the permanence of the preparation.

EXTRACTUM ERIGERONTIS CANADENSIS FLUIDUM.—*Fluid Extract of Canada Erigeron.*—As the menstruum for this preparation the Pharmacopœia of 1870 directed alcohol (s.g. ·835); the Philadelphia College of Pharmacy recommended alcohol (s.g. ·822), and a sample thus prepared in November, 1879, now contains only a slight, apparently resinous deposit on the bottom and sides of the bottle; but as this preparation was chiefly recommended because it was already officinal, and as whatever medicinal value Canada erigeron may possess, is no doubt fully represented by the volatile oil, which is also officinal,

the Committee of Revision acted wisely in dismissing this evidently superfluous preparation.

EXTRACTUM HELIANTHEMI FLUIDUM.—*Fluid Extract of Frostwort.*—For this preparation a menstruum composed of one part of alcohol and two parts of water, was recommended; a sample thus prepared in December, 1879, now contains a rather large precipitate, but is otherwise in good condition; but frostwort having been dismissed from the Pharmacopœia, no preparations of it were adopted.

EXTRACTUM JUNIPERI FLUIDUM.—*Fluid Extract of Juniper.*—For this preparation the juniper was recommended to be in number eight powder, and diluted alcohol the menstruum to be used; a sample thus prepared in January, 1880, now contains only a moderate precipitate, but there is also a considerable quantity of soft, brown, resinous matter on the sides of the bottle above the fluid extract; in other respects the preparation has not deteriorated, the odor and taste remaining as aromatic, and sweet as when first prepared. The specific gravity of this sample of fluid extract is 1·115, and the weight of dry residue from the juniper was fifty-eight per cent.

Juniper, if fresh and of good quality, is very difficult to percolate if finer than number eight powder, and to prove that so coarse a powder may be exhausted, another sample of the fluid extract was prepared at the same time, using the entire fruit, carefully selecting only such as were unbroken; this sample now contains about the same quantity of precipitate as the other, but instead of the brown matter in the upper part of the bottle, there is a very thin coating of a bright green color; the odor and taste are as well preserved as in the other sample, the specific gravity is 1·066, and the weight of dry residue was sixty-one per cent.

Although juniper may not be a very important remedial agent, it is considerably used by physicians, and so elegant and permanent a preparation as this fluid extract might well have been made officinal.

EXTRACTUM LAPPÆ FLUIDUM.—*Fluid Extract of Burdock.*—For this preparation a menstruum composed of one part of alcohol and two parts of water, was recommended; a sample thus prepared in December, 1879, now contains only a slight precipitate, and is otherwise entirely without change. Burdock does not, however, appear to be of sufficient medicinal value or employment to require any officinal preparations thereof.

EXTRACTUM SPIGELIÆ ET SENNÆ FLUIDUM.—*Fluid Extract of*

Spigelia and Senna.—For this preparation the following formula was recommended; Spigelia sixty parts, senna thirty parts, anise five parts, and caraway five parts, all to be mixed together, reduced to number forty powder, and percolated with diluted alcohol; a sample thus prepared in January, 1880, now contains only a very moderate precipitate, which formed soon after its preparation, and a thin coating of separated matter on the sides of the bottle above the fluid extract; in every other respect the preparation is in excellent condition, and although no longer officinal, it will, no doubt, continue to maintain with physicians and the public the prominent and popular position heretofore held by it.

Extractum Sumbul Fluidum.—*Fluid Extract of Sumbul.*—For this preparation a menstruum composed of two parts of alcohol and one part of water, was recommended; a sample thus prepared in January, 1880, now contains only a very slight precipitate, is very dark in color, deep red and perfectly transparent in thin layers; it has kept remarkably well, and no doubt fully represents the drug. Another sample, with alcohol as the menstruum, was prepared at the same time, this is much lighter in color, and soon deposited a white crystalline substance all over the bottom and sides of the bottle; alcohol is evidently not the proper menstruum for this preparation, although the present officinal tincture, containing one part of sumbul in ten, is directed to be made with that menstruum; but as the dose of sumbul in powder is stated to be from ten to twenty grains, this tincture, in addition to being made with an improper menstruum, would contain in an ordinary dose, sufficient alcohol to seriously interfere with the remedial action of the drug; the tincture of the British Pharmacopœia is made with proof spirit, but still the quantity of alcohol is entirely too large in the full dose of the preparation.

The fluid extract recommended above should have been admitted, as it would have proved to be, an elegant, pleasant, and efficient addition to that small and very disagreeable class of medicines to which asafetida and valerian belong.

Extractum Thujæ Fluidum.—*Fluid Extract of Arbor Vitæ.*—For this preparation alcohol was recommended as the menstruum, and a sample thus prepared in December, 1879, now contains only a moderate precipitate, and does not appear to have undergone any other change whatever; but as arbor vitæ, when dry, is said to be no longer efficient, a tincture of the fresh tops would seem to be preferable to the fluid extract.

All of the formulas for fluid extracts requiring the use of alcohol, it seemed advisable to examine commercial specimens as to the actual percentage of absolute alcohol contained therein. Five samples, from as many different manufacturers, were therefore obtained and examined, with the following results, at 15·6° C. (60° F.)

No.	Specific gravity.	Percentage of absolute alcohol.	
		By weight.	By volume.
1	·8185	91·54	94·38
2	·8190	91·36	94·26
3	·8196	91·14	94·10
4	·8207	90·75	93·82
5	·8265	88·56	92·21

The officinal alcohol (s.g. ·820), containing ninety-one per cent. by weight and ninety-four per cent. by volume, it will be observed that three of the five specimens contain a slightly larger percentage of absolute alcohol than the officinal; and also that only one of the samples is considerably below the officinal standard, and this one is said to be not the product of a regular manufacturer of alcohol, but the surplus, or rejected goods, which have been made for another special trade demand. If, during the warm season, no greater variations in the strength occur, no appreciable difference in the product made therewith would result.

In conclusion it may be stated that none of the formulas for the fluid extracts require any special or expensive apparatus in carrying them out, and that they all appear to have been so arranged as to induce the pharmacist to make this important class of preparations himself; the danger of injury from heat, in the evaporation of the dilute percolate, and of loss of activity by precipitation in the finished product, have both been over-estimated by writers on fluid extracts, whose papers have had, perhaps unintentionally, a tendency to deter the pharmacist from trusting himself with their preparation, and led him to rely too much on the reputation and supposed superior facilities of the wholesale manufacturer.

PHARMACEUTICAL PREPARATIONS OF CORN SILK.

By George W. Kennedy, Ph.G.

Read at the Pharmaceutical Meeting, April 17

During the past year several physicians of Schuylkill county have been using different preparations of the stigmata of Zea Mays for catarrh of the bladder and similar diseases with very good results. The preparations should be made from the fresh article, as the dried seems to be worthless, at least that is the experience of those who have had the subject under investigation; cases under treatment, which were not benefited by the powder or other preparations made from the dried article, yielded to a tincture prepared from the fresh or green stigmata. It would be advisable to gather the drug before it begins to change in color, or select only that portion having a green or greenish-yellow color. The writer manufactured a quantity of the tincture last September, which has all been prescribed and used by our physicians, and I am now compelled to purchase the fluid extract to supply the demands. One of our medical practitioners, who is very particular, has great confidence in the curative properties of corn silk; his choice of all the preparations is the syrup which I have made and would recommend to be made from the fluid extract. This is an expeditious mode of making the syrup, and one which is entirely satisfactory, the syrup containing only a very small percentage of alcohol. The diseases for which corn silk is recommended are of such a nature —generally of an inflammatory character—that the patient should not use alcohol in any form, because it produces irritation, and irritants should be left out of the preparations as much as possible.

Should the drug prove to be as valuable a remedy as some medical men consider it to be, there is no doubt but its use would become general. Either the fluid extract or the syrup, or both, would be the best preparations to recommend for introduction, although the tincture gave fair satisfaction; yet I do not believe it to be the most suitable preparation.

It should be remembered that the fresh drug contains a large amount of moisture; it contains certainly not less than fifty per cent., and likely considerably more. I would suggest that not less than double the quantity of the drug be used; for example, if a hundred parts of syrup or tincture was to represent twelve parts of the dried material, then twenty-four parts of the fresh or green corn silk should be used. I would recommend the following formulas:

Tincture of Corn Silk.

Take of corn silk, green, twenty-four parts, ... 24
Diluted alcohol, sufficient to make one hundred parts, . 100

Cut the silk into small pieces, either with a large pair of scissors or a tobacco cutter; after which, place in a mortar and beat into a pulp with a small quantity of the diluted alcohol. Prepare a cylindrical glass percolator, by closing the lower orifice with a cork; transfer the silk pulp to the percolator, and add sufficient of the menstruum to form a layer over the pulp; cover the percolator closely and allow to macerate for forty-eight hours; then loosen the cork enough to permit percolation to proceed at the rate of forty drops per minute; add enough diluted alcohol and continue the percolation until one hundred parts are obtained. The tincture possesses the characteristic odor of corn silk, is of a yellow straw color, and of a pleasant, sweetish taste. Dose for an adult, one or two fluidrachms (gm. 4—8).

Fluid Extract of Corn Silk.

Corn silk, green, two hundred grammes, ... 200
Glycerin, twenty grammes, ... 20
Diluted alcohol, a sufficient quantity to make one hundred cubic centimeters, ... 100

Cut the silk into small pieces. Mix the glycerin with eighty grammes of diluted alcohol. Place the cut corn silk into a mortar, and beat into a pulp with a portion of the menstruum; after which, pack in a cylindrical glass percolator; add sufficient of the mixture to cover the pulpy mass, and when the liquid commences to drop from the percolator close the lower orifice; cover the percolator tightly, and allow to macerate for forty-eight hours; then permit percolation to go on slowly, about forty drops per minute; add the remainder of the glycerin mixture, and then diluted alcohol until the drug is exhausted, reserving the first seventy cubic centimeters of the percolate; evaporate the remainder to thirty cubic centimeters, and mix with the reserved portion, making in all one hundred cubic centimeters. The odor and taste is similar to that of the tincture, but much stronger, and a shade or two darker. Dose for an adult from half to one fluidrachm (gm. 2—4).

Syrup of Corn Silk.

Fluid extract of corn silk, 12 parts, ... 12
Syrup, eighty-eight parts, ... 88

To make one hundred parts, ... 100

Dose from one to two fluidrachms (gm. 4—8).

Pottsville, Pa., April, 1883.

THE LACTOMETER FOR DETERMINING THE VALUE OF MILK.

By Gustavus Pile.

The analysis of milk by the methods usually given, although seeming quite simple and capable of yielding satisfactory results with but little skill, is, however, an operation requiring considerable care and nicety of manipulation, making it altogether beyond the ability of the general public and the dealer to practice. It would appear on first thought as though the specific gravity would afford an excellent method for determining the amount of solid matter in the milk, but on account of the great difference in the gravities of the several constituents it has proved to be at times very misleading; for a rich milk, containing a very large percentage of cream, would surely give a specific gravity too low, the cream having a gravity that would reduce the whole to a point indicated by a poor sample. Now, in order to make the specific gravity available as a basis for forming a scale that would prove useful, I made several experiments in order to separate, if possible, the fatty portion by means of a solvent and thus get rid of the chief obstacle, but on account of the great emulsifying capacity of milk, all efforts in that direction proved ineffectual. An illustration of this power of milk is seen by the samples exhibited, where the attempt was made to dissolve the fat by the addition of chloroform. It was thought that by agitating it and milk together the fat would be extracted and carried to the bottom of the tube, leaving the upper portion in a condition to be tested for the amount of remaining solid matter by means of a hydrometer floated in it. In one of the test tubes, 5 cc. of chloroform and 10 cc. of milk are mixed and not the slightest vestige of separation can be seen; in the other tube equal volumes of each are used and the amount of separation is very slight, even after the lapse of several hours. Bisulphide of carbon, ether, benzin, alcohol, and several mixtures were also tried, but all were found to be emulsified to a degree that rendered the use of such solvents entirely useless. The best method for effecting the separation appears to be the natural process of allowing the cream to rise to the surface and then drawing it off; and while there will still be a portion of cream remaining permanently in the milk, yet, according to a number of experiments, the percentage appears to be nearly uniform in proportion to the amount of the other solids and can therefore be esti-

mated in making a scale. The table here presented has been made from quite a number of observations, and a lactometer scale made to correspond with it, representing the percentage of solid matter, will be found to give results closely coinciding with an actual analysis. The specific gravity of 1·0320 is taken as a standard for pure milk after being skimmed, and the amount of solid matter it contains equal to 14 per. cent, including the fat held in suspension.

Specific Gravity.	Per cent. solids.	Per cent. water.
1·0320	14·	0·
1·0297	13·	7·7
1·0291	12·7	10·
1·0280	12·	14·3
1·0267	11·6	20·
1·0251	11·	27·5
1·0246	10·8	30·
1·0229	10·	40·
1·0213	9·3	50·
1·0206	9·	55·5
1·0200	8·7	60·
1·0188	8·2	70·
1·0183	8·	75·
1·0178	7·7	80·
1·0168	7·3	90·
1·0160	7·	100·

In using the lactometer made according to this scale, it is first necessary to fill, with the milk to be tested, a jar graduated to indicate the percentage of cream, allow it to stand for a length of time sufficient for the cream to rise, this will be from 6 to 8 hours, when a distinct demarcation will allow the percentage to be readily read off. By means of a pipette the cream is to be removed, and the lactometer floated in the milk, when the per cent. of solids can be seen without any further operation. This is a very easy process and can be conducted by the consumer or ordinary milkman, and will give results that are reliable enough for all practical purposes.

Another method intended for those who buy milk in large quantities from surrounding dairies is the one here described. The instruments required are two graduated jars for showing the percentage of cream, called creamometers, one per cent. glass and a lactometer. Fill one of the creamometers to the mark designated 10 with milk that is known to be pure and drawn from several cows. This will be the standard for pure milk for that day. Fill the other creamometer to the same mark with the milk to be tested, and set both aside for the

cream to rise. Note the quantity on each, and if the amount is less on the sample tested than on the other it indicates dilution or skimmed milk. Now remove the cream from each and introduce the lactometer in the one containing the pure milk and note the mark on the scale where it floats. Then remove it to the other jar and note also where it floats. If it sinks lower than the first it is evidence of dilution. Replace the lactometer in the jar of pure milk, and from the per cent. glass filled with water exactly to the line marked 0, pour into it enough water to cause the lactometer to sink to the same mark as that shown by the diluted milk. By reading off the amount of water used the exact percentage of dilution will be seen.

It has been asserted that more cream will rise from milk that has been slightly diluted than from the pure article, but after repeated trials with varied amounts of water, ranging from 10 to 25 per cent., I have seen no such result, but the ratio always remains about the same. I have noticed, however, that there is considerable difference in the time required for the separation to take place.

MYRTUS CHEKEN.

By Joseph Winters England, Ph.G.

From an Inaugural Essay.

The author refers to the characters of the myrtaceæ in general, and to the botanical relations and histological characters of the shrub in question, citing among others, the accounts on this subject given by Mr. E. M. Holmes, "Pharmaceutical Journal," February, 1879, Prof. Asa Gray (U. S. Exploring Expedition, p. 510), Mr. J. Hoehn (see p. 253), and Dr. J. Moeller "Am. Jour. Phar.," 1882, p. 461. The essay was accompanied by various drawings, and by specimens of the products obtained by the following chemical examination:

The relative proportion of stems and leaves to each other, by weight, was as 1 to 1·84. Two separate analyses were made, one of the stems, the other of the leaves.

ANALYSIS OF STEMS.

1. *Estimation of Moisture.*—10 gms. of stems in a moderately fine powder were placed in a drying chamber, and kept at 110° C. until all moisture was driven off; the loss amounted to 1 gm., or 10 per cent.

2. *Estimation of Ash.*—2·89 gms. of stems, in a moderately fine powder were incinerated, the weight of ash was 0·14 gm. or 4·84 per

cent. This ash was digested in water, residue treated with hydrogen chloride, and balance dissolved in sodium hydrate. Separate analyses were made, the several tests showing the presence of potassium, magnesium, calcium, and aluminium, in combination as chlorides, phosphates, sulphates and carbonates, and silica.

3. *Estimation of Benzin Extract.*—373·24 gms. of stems, in a moderately fine powder, dampened with petroleum benzin, and packed in a glass percolator, were macerated and slowly exhausted by displacement. The percolate measuring 1·89 liters, was set aside in a tared dish to evaporate spontaneously, all remaining benzin was driven off by a water-bath. The extract weighed 20·34 gms., or 5·45 per cent.; it was unctuous to the touch, liquid at 43° C., and of firm consistence at 29° C. It was treated with water, the solution filtered, gave on evaporation a light yellow, tasteless, amorphous, inert coloring matter. The residue of extract was treated with alcohol (90 per cent.), a small portion only being soluble, this solution on dilution with water became milky, and on evaporation yielded a yellow, fixed oil, of peculiar odor, and persistent, intensely bitter taste. The residue of extract as left undissolved, was of an unctuous, fatty character; it was saponified with potassium hydrate, the soap thus formed decomposed by hydrogen chloride, and set aside for twenty-four hours, then diluted with water, filtered and evaporated, depositing a yellow crystalline matter which, when treated with alcohol, filtered and evaporated, gave, as seen by the microscope, tabular crystals of light yellow color, almost tasteless, freely soluble in alcohol or ether. This fatty acid was associated with a small amount of potassium chloride.

4. *Estimation of Alcoholic Extract.*—The residue of stems left in the percolator was next exhausted with alcohol (90 per cent). The percolate measuring 1·89 liters, was evaporated to the consistence of an extract, weighing 23·32 gms., or 6·25 per cent. It was redissolved in alcohol, and on the addition of water, a precipitate, weighing 14·58 gms., or 62·5 per cent. of the extract was deposited. The precipitated body was resinoid in character, light green in color, and tasteless. It was dissolved in ether and spontaneously evaporated; the resultant mass was of pilular consistence, dark olive green in color, and neutral in reaction, soluble in ether, alcohol, chloroform, or carbon disulphide. The solution of the resin in potassium hydrate is brownish-black, and mineral acids throw down from it green precipitates.

The filtrate from the precipitated resinous matter yielded a brown extractive, associated with a very small quantity of tannin.

5. *Hydro-alcoholic Estimation.*—The residue of stems left after the preceding estimation was then exhausted with diluted alcohol, yielding a percolate of 1·89 liters. An aliquot portion when reduced to extractive consistence showed the weight of the dissolved portion to be 19·44 gms., or 5·2 per cent.

To a portion of the percolate a solution of basic acetate of lead was added, the precipitate of tannate of lead collected on a filter, and filtrate (*a*) set aside. The precipitate was washed, suspended in water, decomposed by a stream of hydrogen sulphide, and filtered; the amount of tannin present was found to be small. The filtrate (*a*) from the first precipitated solution was decomposed by hydrogen sulphide, heated, and filtered; the solution being acid in reaction and failing to crystallize on concentration, it was neutralized with a solution of potassium carbonate, and on evaporation yielded white crystals, of a sharp taste, and inodorous.

6. *Aqueous Estimation.*—100 gms. of stems yielded 4·08 per cent. of extract. To 31·1 gms. of the coarsely ground stems 450 cc. of water was added and boiled slowly down to 240 cc., this decoction was perfectly cloudless, without coagulation, and not gelatinous on cooling. A portion of the decoction, reduced by evaporation to one-fourth of its bulk, when mixed with alcohol, gave a brown glutinous precipitate of gum and coloring matter; the remainder was tested with iodine solution, hydrochloric and nitric acids, and remained unchanged.

ANALYSIS OF LEAVES.

1. *Estimation of Moisture.*—5 gms. of leaves were placed in a drying chamber, kept at 110° C., until they ceased to lose moisture; net result 4·5 grms., showing actual loss by volatilization of 0·50 gms., or 10 per cent.

2. *Estimation of Ash.*—In a porcelain crucible were placed 1·25 gms. of leaves, and a gentle heat, gradually increased, was applied until incineration was effected. The ash amounted to 0.105 gm. = 8.4 per cent. Chemical analysis showed the constituents to be potassium, magnesium, calcium and aluminium in the form of chlorides, phosphates, sulphates, and carbonates, and silica.

3. *Estimation of Volatile Principles.*—124·42 gms. of leaves were placed in a glass vessel, macerated for twenty-four hours in water, then distilled, giving a distillate of 354·8 cc. This distillate was neutral, possessing an aromatic, and camphoraceous odor similar to oil of Eucalyptus, and contained a layer of light yellow volatile oil, amounting to

2 per cent. The oil burns with a white flame, is soluble in alcohol, ether, or chloroform, and on testing with ferric chloride, shows the absence of phenol-like bodies. The addition of a strong solution of potassium hydrate produced a copious, dense white precipitate. The oil oxidizes by long exposure to air, to an acid, and is evidently an aldehyde. Nitric acid, in the cold, has little effect, but when warmed, energetically oxidizes it, coloring it at first purplish, changing rapidly into a red-brown resin. The addition of potassa to an alcoholic solution of this resin gave a dark brown color, and evolved a strong aromatic odor, dissimilar to that of the essential oil, but resembling more that of Tonqua bean; the solution on standing became a semi-crystalline, reddish mass, aromatic in taste.

To ascertain if any volatile alkali was present, the residue in the still was treated with potassium hydrate, and the distillation continued. The distillate was of a strong, disagreeable odor (probably owing to a decomposition product), and decidedly alkaline in its reactions; but the red color of the litmus paper was slowly restored on drying. The distillate was neutralized by hydrogen acetate and slowly concentrated in a water-bath, giving off vapors highly charged with the alkaloidal odor. Tested by Mayer's Solution and by solution of iodine in iodide of potassium, no change was observed seemingly, showing the absence of alkaloid. The solution was now evaporated spontaneously; the residue purified by recrystallizations from alcohol, when small, white, delicately tufted crystals were obtained, of strong, peculiar, cheken-like odor, made more prominent when moistened with the breath, and having a feeble, bitter taste. This alkaloid I have named *chekenine*. The acetate is soluble in alcohol or water, but insoluble in ether. Phosphomolybdic acid gives a copious, dense white precipitate from the alcoholic solutions of its salts, which are insoluble in excess of alcohol or ether, but redissolved by large additions of water. Nitric acid causes little change, but if followed by potassium ferrocyanide, a light green, deepening into an emerald green color, is produced. This reaction is very characteristic.

On examining a fluid extract of long standing, made with 70 per cent. alcohol, a deposition of crystals was noticed. They were separated from the liquid by filtration, purified by washing with ether, and on examination were found to be chekenine, which had evidently been precipitated from the concentrated solution by the presence of its tannin.

4. *Estimation of Benzin Extract.*—622·08 gms. of powdered leaves, dampened with petroleum benzin and packed in a glass percolator, were macerated for two days, and then slowly exhausted by displacement. The percolate, which measured 189 liters, was set aside in a tared dish to evaporate spontaneously, and yielded 32·98 gms., or 5·3 per cent. of extract. This extract was treated with water, which gave a solution depositing upon concentration a bright yellow coloring matter; a solution of this was neutral, and when tested for the presence of glucosides by Trommers' test, gave negative results. The residue was then subjected to the action of alcohol, which dissolved out volatile oil, chlorophyll, and left on evoporation a small amount of an inodorous, light yellow, bland fixed oil. The residue of matter left consisted of fixed oil, wax, and tasteless extractive matter.

5. *Estimation of Alcoholic Extract.*—The residue of leaves from the preceding examination was treated with alcohol (90 per cent.), 1·89 liters of percolate was obtained. One-half of this percolate was reduced to an extract weighing 31·73 gms., or 10·2 per cent. of the whole, and was of a dark green color, odorless, tough and astringent. The other half of the percolate reduced to a syrupy consistence, was strongly agitated with acidulated water, precipitation ensued. The solution was filtered and the precipitated matter dissolved in ether; this, when spontaneously evaporated, left an odorless, resinoid body, tough, leathery, and of a greenish-black color; its weight was 3·33 gms., or 5·2 per cent. of the extract. The alcoholic solution of the resin was neutral in its reactions. Its solution in potassium hydrate was yellowish-brown, and readily precipitated by mineral acids.

The filtrate of the above was concentrated, and found to contain tannin, in small amount, accompanied by dark brown extractive matter, slightly bitter, freely soluble in dilute alcohol, but insoluble in water.

6. *Estimation of Hydro-alcoholic Extract.*—The residue of leaves left from the previous exhaustion by alcohol was next displaced with diluted alcohol. The percolate measured 2·84 liters. One-half of the percolate reduced to an extract gave 19·44 gms., or 6·25 per cent. of the whole. To the remaining portion of the percolate a solution of basic acetate of lead was added, the precipitate formed was separated by filtration, and the filtrate (*a*) reserved. After thoroughly washing the precipitate and suspending in water, it was decomposed by gaseous hydrogen sulphide and the filtrate tested for the presence of tannin, giving a blue-

black color with ferric salts, a bulky precipitate with gelatin, and a precipitate with tartrated antimony. The tannin was estimated by Watts' aluminated gelatin solution, according to the method in "Sutton's Volumetric Analysis," and found to amount to 4 per cent.

The reserved filtrate (*a*) was treated with hydrogen sulphide in the same manner as above; the acid filtrate was concentrated; and failing to crystallize when set aside, it was neutralized with a solution of potassium carbonate, when it yielded whitish crystals, grouped in irregular masses, of a warm, pungent taste, partially soluble in alcohol, freely so in dilute alcohol, and insoluble in ether.

7. *Estimation of Aqueous Extracts.*—Decoction: 100 gms. of perfectly dried leaves left after the hydro-alcoholic determination, boiled with water in a porcelain-lined vessel, yielded a clear, dark brown decoction, having no odor, and by appropriate tests showing the presence of gum, starch, coloring and extractive matters. Its extract amounted to 4·5 per cent.

Infusion: 100 gms. of leaves were macerated in 450 cc. of cold water. The infusion was of a light brown color, of the aromatic peculiar odor of the leaves, and of a pleasant slightly astringent taste. A portion boiled remained perfectly clear, and mineral acids effected no change.

RECAPITULATION.

STEMS.

1. Moisture ..... 10 per cent.
2. Ash ..... 4·84 per cent. chlorides, phosphates, sulphates and carbonates of potassium, magnesium, calcium, and aluminium; silica.
3. Volatile principles .....
4. Benzin extract ..... 5·45 per cent. yellow color, fixed oil, fatty acid.
5. Alcoholic extract ..... 6·25 per cent. resin, tannin, extractive.
6. Hydro-alcoholic extract ..... 5·2 per cent. tannin, organic acid, extractive.
7. Aqueous extract ..... 4·08 per cent. gum, color.

LEAVES.

1. Moisture ..... 10 per cent.
2. Ash ..... 8·4 per cent. chlorides, phosphates, sulphates and carbonates of potassium, magnesium, calcium, and aluminium; silica.
3. Volatile principles ..... Volatile oil, volatile alkaloid.
4. Benzin extract ..... 5·3 per cent. yellow color, volatile oil, chlorophyll, fat, wax.
5. Alcoholic extract ..... 10·2 per cent. resin, tannin, extractive.
6. Hydro-alcoholic extract ..... 6·25 per cent. tannin (4 per cent.), organic acid, color, extractive.
7. Aqueous extract ..... 4·5 per cent. gum, starch, color, extractive.

PHARMACEUTICAL PREPARATIONS.

The active principles of cheken, as seen above, reside wholly in the leaves, and are a volatile alkaloid, in combination with an organic acid, volatile oil, tannin, fixed oil, resin, and minor proximate bodies. It is obvious that the best preparations of the leaves are those containing all the active ingredients. By various experiments, alcohol diluted with one-third of water was found to be the best solvent, and maceration followed by percolation, the best method for extraction. A fluid extract submitted was prepared according to the general process of the United States Pharmacopœia ('70) with a menstruum composed of alcohol three parts, water one part; its dose is one to three fluidrachms. A 20 per cent. tincture may be made with the same menstruum, and a convenient strength of the infusion is 10 per cent.

THERAPEUTIC PROPERTIES.

Cheken has lately been brought quite prominently into notice by the writings of Dr. Henry Von Dessauer, of Valparaiso, and Drs. Wm. Murrell and E. M. Holmes, of London, in the treatment of bronchitis, laryngitis, diphtheria, hæmoptysis, etc.; tonic, diuretic, expectorant and antiseptic properties are claimed for it.

NOTE.—In connection with the foregoing abstract we give place on the next page to the paper by Mr. J. Hoehn, which we copy from the "Therapeutic Gazette" of Detroit, to whose publisher we are indebted for the loan of the wood cuts.—*Editor.*

Elixir Cascara Sagrada.—W. T. Wenzell recommends the following: Fluid extract of rhamnus Purshiana f℥iv, simple elixir f℥xxvii; potassium carbonate ʒii.—*Proc. Cal. Phar. Soc.*, 1883.

Purification of Petroleum Benzin.—The disagreeable odor of petroleum benzin is, according to the experiments of Fred. Grazer, not removed by percolation through wood or animal charcoal, or by treatment with carbonate of sodium or lead carbonate. Agitation with potassium plumbate removed a portion of the odor, but satisfactory results were obtained by using two ounces of potassium bichromate, 12 ounces of water and 3 ounces of sulphuric acid, and when cool agitating with this a pint of benzin; finally, washing with water is necessary. A very useful method for disguising the remaining odor is to shake the product with a portion of cologne water and setting aside for two or three weeks, when it may be decanted; the odor of the perfume will predominate.—*Ibid.*, pp. 45, 46.

A CHEMICAL AND MICROSCOPICAL EXAMINATION OF CHEKEN LEAVES.

By Jno. Hoehn.[1]

Summary of results:[2]

	Per cent. of drug.
Moisture,	9·48
Total ash,	9·48
Sol. in H_2O: KCl, K_2SO_4	·68
Insol. in H_2O, sol. in HCl: *Bases*, Mg, Ca, Al; *Acids*, H_3PO_4, H_2CO_3	5.61
Insol. in H_2O, HCl; sol. in NaOH: combined silica,	2·45
Insol. in H_2O, HCl and NaOH: sand and clay,	·73

Estimation of benzol extract.

Total benzol extract,	8·74
Volatile oil,	3·7
Sol. in H_2O,	·5
Organic matter,	·35
Ash,	·14

Had negative results for organic acids and alkaloidal reagents, except phosphomolybdic acid, which gave a light green coloration, but on the addition of ammonia turned a darker green, followed by a prec., coming down rapidly on the application of heat. But got a test for glucoside as follows: By heating the solution with a few drops of H_2SO_4 for 10 minutes, neutralizing with NaOH, then adding Fehling's solution and heating 5 minutes, the cupric salt being then reduced to Cu_2O.

	Per cent. of drug.
Insol. in H_2O; sol. in HCl,	·45

The same results as in the H_2O sol.

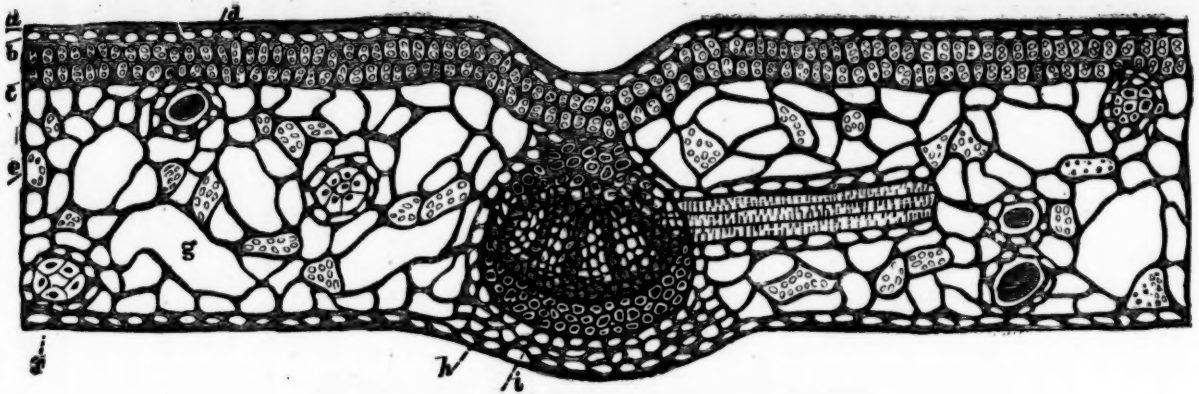
Insol. in H_2O, HCl; sol. in 80 per cent. alcohol: chlorophyll and resins,	2·08
Insol. in H_2O, HCl and 80 per cent. alcohol: wax and fixed oils,	1·89

Estimation of alcohol extract.

Total alcohol extract,	22·86
Powder separated on cooling,	2·96
Ash from extract,	2·47
" insol. in H_2O,	1·02
Organic matter insol. in H_2O,	7·25
Organic matter and ash soluble in water,	11·63

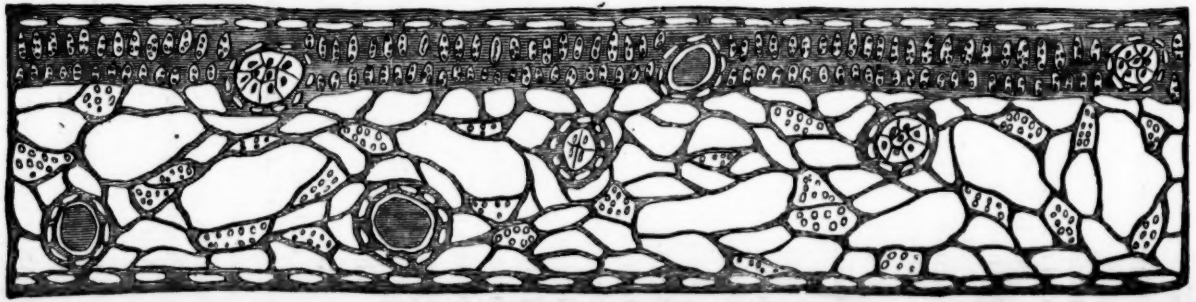
[1] An abstract from Graduation thesis, University of Michigan.

[2] In this work I followed Mr. H. B. Parson's scheme for Plant Analysis, as being more simple than that by Wittstein and Rochleder. See "Amer. Jour. Phar.," April, 1880, p. 210.



CHEKEN LEAF—CROSS SECTION ACROSS THE MIDRIB.

a—Cuticle. *b*—Epidermal cells. *c*—Palisade cells. *d*—Oil cells. *e*—Parenchyma cells. *f*—Resin cells. *g*—Intercellular spaces. *h*—Bast-fibre. *i*—Woody prosenchyma.



CHEKEN LEAF—LONGITUDINAL SECTION.

The alcohol extracts contain tannin and other organic acids, extractives, the remaining alkaloids, glucosides and resins. Not having a Gooch's filter, I discontinued the estimation of the alcohol extract, but estimated the tannin according to a method given in the "Chemical News," vol. xxix, page 189, and obtained 4·2 per cent.

	Per cent. of drug.
Total cold water extract: gums and dextrin,	3·9
Ash,	1·05
Starch from acid extract,	6·85
The remainder, being albuminous substances and cellulose, amounting to	48·17

I also obtained a greenish colored resinoid in the same manner that resin of podophyllin is obtained from the alcoholic extract of podophyllum.

I also think that the antiseptic properties of the drug are due to the volatile oil, which I think is an aldehyde, being changed to an acid on oxidation. I will try and prove by further experiment.

MICROSCOPICAL EXAMINATION.

The upper side of the leaf is depressed at the midrib, and the under side elevated. The epidermis is composed of thick-walled empty cells and a thick cuticle. Next come two rows of palisade cells, filled with starch and chlorophyll. Between the palisade cells and lower epidermis are thick-walled parenchyma. Among this there are oil and resin cells and intercellular spaces. The resin cells seem to have a cellular structure. The midrib is composed of three zones, the upper and lower zones made up of bast-fibre, and the middle one of wood prosenchyma. In the drawing I have represented a branch of the midrib, composed of reticulated vessels. The only difference between the cross and longitudinal is the elongation of cells in the longitudinal section.—*Therapeutic Gazette*, Aug, 1882, pp. 284—286.

Camphorated Sulphur Lotion.—Pierre Vigier recommends the following modification of the *lotion au soufre et au camphre:* Rose-water 250, camphor 30, precipitated sulphur 20, powdered gum arabic 8 parts. This remains a homogenious mixture for a considerable length of time and, when in the course of time the insoluble constituents have separated, may again be made uniform by gentle agitation.—*N. Y. Med. Jour.*, Jan. 20, 1883. *Gaz. Hebdom. Med. et Chir.*

A RESEARCH ON THE ALKALOID GELSEMINE AND SOME OF ITS CRYSTALINE SALTS.[1]

By A. W. Gerrard, F. C. S.

The alkaloid under notice is yielded by the *Gelseminum sempervirens*, or Carolina jasmine. The natural order of the plant is doubtful, being placed by De Candolle in the Logoniacæ, by Decaisne in the Apocynaceæ. The drug found its way into regular medical practice through the eclectics, and is now official in the United States Pharmacopœia.

In this country it has attained a good reputation for the treatment of toothache and neuralgia. The part of the plant used is the root, from which are prepared a tincture and liquid extract, also a resin called gelsemin. A detailed account of the history, characters and composition of the plant will be found in a valuable paper by E. M. Holmes, in the "Pharmaceutical Journal," December 18, 1875.

The first communication within my knowledge, having reference to the chemical constituents of gelseminum root, was contributed by Kollock to the "American Journal of Pharmacy," 1855, p. 203, the principal facts elucidated being, that it contained gelseminia, dry resin, volatile oil, fatty resin and a yellow coloring matter. This was followed in 1869, with a paper by Eberle, who examined the woody portion of the root for alkaloid, and states, "The wood of the root can be safely asserted, from careful experiment, to be free from alkaloid." This observation I have corroborated. In 1870 an important addition was made to our knowledge of its constituents by Dr. Wormley, who discovered the presence of an interesting highly fluorescent body, which he named gelseminic acid. At the same time he described the physical characters and chemical reactions of the alkaloid gelsemine.

In 1876 Professor Sonnenschein communicated to the "Berichte d. deutschen Gessellschaft, Jahr. ix.," the results of analyses of gelseminic acid and the alkaloid gelsemine. For the alkaloid was found the formula $C_{11}H_{19}NO_2$, and for its hydrochloride $(C_{11}H_{19}NO_2)_2HCl$. No simple crystalline salts were obtained by either Sonnenschein or Wormley. For gelseminic acid Sonnenschein gave the formula $C_{30}H_{34}O_{19}$ and claimed its identity with esculin. This claim has since been controverted by Wormley.

Five years ago, I prepared some gelsemine for physiological use,

[1]Read at an Evening Meeting of the Pharmaceutical Society, Februry 7, 1883.

and particularly noticed that the published processes for its extraction did not yield a product that could be called pure, as it was more or less colored yellow or brown. I also observed that traces of gelseminic acid persistently adhered to the alkaloid, as evidenced by the fluorescence of the latter in the presence of alkalies. At this time I was strongly impressed with the above defects, and doubted not that if gelseminia could be obtained in a sufficient state of purity (possessed as it is of such strongly basic characters) its salts could be made to crystallize. The small quantity of alkaloid at my command did not admit of many experiments, and these were without result. Later on, I prepared the alkaloid in small quantity, and obtained one of its salts in microscopic crystals, sufficiently well defined to determine me to make an investigation on a larger portion of material. I am now able to state I have prepared in the crystalline form the pure alkaloid and a number of its salts.

Method of Extraction.—Twelve kilograms of well-powdered root were exhausted with alcohol, which left after distillation 1703 grams of soft extract. The extract on resting, separated into two strata.

The superstratum, green in color and having the appearance of an oleo-resin, was removed and found to be practically insoluble in water; it was well shaken with dilute hydrochloric acid to remove traces of adhering alkaloid, and the said solution mixed with the substratum. The substratum, containing the alkaloid, was diluted with water until it ceased to precipitate resin, and left a clear bright brown solution which was evaporated at a temperature below 60°C., treated with ammonia in excess and thoroughly washed with ether. The ether solution, now containing the gelsemine and beautifully fluorescent from the presence of gelseminic acid, was decanted and exposed a short time to allow excess of ammonia to escape. Hydrochloric acid was next added in fractions with agitation until the fluorescence was destroyed, a certain indication that the whole of the alkoloid had been removed from the ether. The hydrochloride of gelsemine had now separated from the ether, forming a layer of pale yellow amorphous precipitate, which upon separation was subjected to several reconversions, until the last traces of color and fluorescence had disappeared, the product being 20·2 grams of perfectly white hydrochloride of gelsemine. It may here be mentioned that the pure alkaloid obtained from the hydrochloride by alkali, and chloroform or ether, holds its solvents tenaciously, and requires the heat of a water-bath to effectually remove them. During

their removal the gelsemine swells into vesicles which, on cooling, can be easily powdered.

Properties of Gelsemine.—It is a brittle transparent solid, crystallizing with difficulty from alcohol. Boiling water sparingly dissolves it, the solution on cooling becoming faintly turbid from separation of gelsemine. It softens at 38° C. and becomes fused at 45° C. Heated on platinum it ignites, burning with an orange-yellow flame and leaving no trace of residue. Solutions of its salts have a distinctly, but not a powerfully bitter taste, and give with potash or ammonia white precipitates soluble in excess. If the solution containing excess of ammonia be exposed to the air, as the ammonia is eliminated the gelsemine separates in granular crystals. The pure base gives no color reaction with strong nitric acid, and the mixture is scarcely changed in color by heating. Strong sulphuric acid has no apparent reaction upon it; but if to the mixture a little manganic oxide be added, and rubbed with a glass rod, a deep crimson red is obtained, passing to green. This reaction is exceedingly delicate, and can be easily shown by dissolving 1 milligramme of pure gelsemine in 10,000 milligrammes of strong sulphuric acid, then adding a few milligrammes of manganic oxide. It can be even demonstrated with a solution of 1 in 100,000. If the preceding reaction is performed upon the pure alkaloid, the color is sufficiently intense to cause it to be mistaken for strychnia; but if a parallel experiment be carried on with strychnia the two alkaloids cannot be mistaken, for the strychnia gives an intense purple, passing to red. Picric acid gives a yellow crystalline precipitate; gold chloride, a yellow amorphous precipitate, soluble in boiling water, separating on cooling, partly in crystals. Platinic chloride gives a yellow precipitate, soluble on boiling.

The following salts were prepared and obtained in crystals. Hydrochloride, hydrobromide, sulphate and nitrate. The hydrochloride is a moderately soluble salt, separating from water as an apparently amorphous powder, consisting really of small granular crystals. It is sparingly soluble in cold, more soluble in hot alcohol; from the latter it separates slowly in prismatic crystals. The hydrobromide crystallizes more readily from water and alcohol than the hydrochloride, forming prisms. The sulphate and nitrate very freely soluble in water and alcohol, and crystallized indifferently on spontaneous evaporation.

Since the alkaloid I obtained differed in important respects from that experimented upon by others, and was evidently in a higher state of

purity, it was thought desirable to submit it and some of its compounds to combustion.

REACTIONS ASCRIBED TO GELSEMINE.

	Gerrard.	Sonnenschein.	Wormley.
Strong nitric acid	No reaction.	Yellow-green color.	Brownish-green, changing to deep green color.
Strong sulphuric acid.	No reaction.	Yellow-green, passing to reddish-brown color and upon heating to dark red.	Dissolves with a red or brown color which after a time assumes a pinkish hue. Warmed it acquires a chocolate or violet color.
Sulphuric acid and manganic oxide.	Gives a damask red color, passing to green or blue.		
Strong sulphuric acid, and bichromate of potash in crystal.	A crimson evanescent redness passing to a green color.	A cherry-red color, changing a little to violet, which soon form a bluish-green spot.	Reddish-purple streaks along the path of the crystal.
Gold chloride.	Yellow precipitate, soluble when heated.	Yellow percipitate, not altered by heat.	
Platinum chloride.	Amorphous yellow precipitate, soluble in water on heating.	Amorphous yellow precipitate, soluble in water on heating.	
Potash mercuric iodide.	White precipitate, which dissolves on heating & separates on cooling.	A white precipitate, which dissolves on heating and separates on cooling.	

Three determinations of nitrogen were made by the absolute method from the pure alkaloid, and the following percentages by weight calculated:—7, 7·3 and 6·9.

Four combustions with cupric oxide and copper of quantities varying from ·100 to ·200 gram gave the following percentage of carbon and hydrogen:

	C.	H.
1	70·4	7·2
2	70·1	7.3
3	70·3	6·9
4	70.45	7·3

Taking the oxygen by difference these figures admit the construction of the following formula for gelsemine, $C_{12}H_{14}NO_2$, for which theory requires 70·6 C, 6·86 H, 6·86 N, and 15·68 O.

The chlorine was estimated from the hydrochloride, and 8·1 per cent. found, showing the composition of this salt to be $(C_{12}H_{14}NO_2)_2HCl$, which requires 7·96 per cent. chlorine. In like manner, the hydrobromide was found to yield 16·21 per cent bromine=$(C_{12}H_{14}NO_2)_2HBr$, which requires 16·3 per cent.

The platinum and gold salts of the alkaloid were purified and burnt;

the former gave 16·7 per cent. platinum, the latter 36·9 per cent. gold, pointing to a composition for the former of

$$(C_{12}H_{14}NO_2)_4(HCl)_2PtCl_4,$$

for the latter $(C_{12}H_{14}NO_2)_2HCl(AuCl_3)_2$, these requiring respectively 16·4 platinum and 37·4 gold.

The main features of this as differing from previous researches show —(1) that the alkaloid gelsemine can be obtained in a state of purity as a crystalline colorless solid, forming crystalline salts with acids, and giving no color reactions with nitric or sulphuric acids; (2) that the pure base has the formula $C_{12}H_{14}NO_2$, thus differing greatly from the formula obtained by Sonnenschein, who, it is certain, must have used an impure substance, as shown by the color reactions his alkaloid gave with nitric and sulphuric acids.

Forensic Note.—In cases of poisoning by gelseminum, where the resin, extract, or tincture have been employed, no difficulty need be experienced in detecting its presence, all these preparations containing gelseminic acid, which imparts its powerful blue fluorescence to any mixture on the addition of an alkali. When the alkaloid gelsemine has to be sought, its isolation can be effected by any of the methods followed for strychnine, especially taking advantage of the fact that gelsemine like strychnine is not destroyed by strong sulphuric acid. After isolation, and showing its alkaline and alkaloidal nature, its most special reaction would be the red color with sulphuric acid and manganic oxide. These characters alone should scarcely be deemed sufficient evidence of its presence. In addition, its physiological action should be sought and demonstrated; if this be obtained it may be concluded gelsemine is present.

Detection of Morphine in Quinine.—Brand directs attention to an extremely delicate and readily applied test which was first recommended nearly twelve years ago (see *Amer. Jour. Phar.*, 1872, p. 540), and which is as follows: A mixture is made of 6 drops of solution of ferric chloride sp. gr. 1·480 and 25 gm. of water; add to 15 drops of this liquid in a porcelain dish 3 drops of a solution of 0.1 gm. potassium ferricyanide in 15 gm. of water. This mixture is of a brownish color, and in about 15 minutes becomes greenish; on the addition of a little quinine salt or of a neutral solution of it, there is instantly produced a blue precipitate in case of contamination with a mere trace of morphine.—*Phar. Zeitung*, 1883, W. 20.

ANALYTICAL RESEARCHES AND INVESTIGATIONS.

COLLATED BY PROF. FREDERICK B. POWER, PH.D.

The Methods for the Destruction and Extraction of Cadavers with a View to their Examination for Inorganic Constituents. By Paul Jeserich.—The application of hydrochloric acid and potassium chlorate for the destruction of organic substances has the disadvantage that large amounts of foreign bodies, potassium salts, are introduced into the substance under examination, which thereby render many operations, such as evaporation, slow or more difficult; and in many cases where the detection of abnormal amounts of potassium salts is required, in cases of poisoning with potassium oxalate, potash soap, and similar substances, the method is not at all applicable. The author recommends upon the basis of several years' experience, the application of chloric acid instead of potassium chlorate. The well divided mass is mixed with water to a thin paste, chloric acid, in small portions, is then gradually added, and the mixture carefully heated on a water-bath. After a short time the organic matter swells up to a sponge-like mass, and by the addition of small amounts of hydrochloric acid a vigorous development of chlorine and very energetic action ensues. In the course of from two to three hours the mass is converted into a thin paste and becomes separated by the continued development of chlorine into a supernatant layer of nearly pure fat, and a lower, slightly yellowish, clear solution. After moderate dilution with distilled water it is allowed to cool slowly, the solidified fatty layer punctured, and the clear liquid which contains the metals decanted. The treatment of the mass to be destroyed with chloric acid is best accomplished in an open capsule, and a flask with a receiver is only employed in cases when volatile chlorides might escape. It is to be carefully observed by the addition of the hydrochloric acid that chloric acid is always in excess in order that lower products of oxidation which might be formed shall not be volatilized, and also that the concentration is not carried too far, as otherwise the action is too energetic, the mass may become black, and slight explosions, accompanied by flame, may readily occur. If the destruction of the organic substances, after concentration with the chloric acid is not sufficiently complete, the liquid is diluted with water, and chloric acid again added. For the preparation of the chloric acid the barium is precipitated from a solution of barium chlorate by means of sulphuric acid,

and the filtered liquid concentrated in vacuo, an excess of sulphuric acid being avoided for the better preservation of the liquid; or a solution of potassium chlorate is precipitated by hydrofluosilicic acid. —*Chem. Zeitung*, No. 8, 1883, p. 108, from *Rep. an. Ch.* 2, p. 369.

On Two Coloring Substances for Red Wines. By Carl Amthor.—For the recognition of *vegetable red* (rouge végétal), a substance belonging to the aniline dyes, 100 cubic centimeters of the red wine are evaporated in order to remove the alcohol, and after strongly acidulating with sulphuric acid shaken with ether, and the ether allowed to evaporate in a small porcelain capsule, together with a white woolen thread; the latter becomes of a fine brick-red color, by the addition of a drop of ammonia transitorily violet, and then discolored; by the application of acetic ether, the wool assumes a fine rose-red color, and, on the addition of ammonia, violet. By agitating the wine with amylic alcohol, the latter is colored red as in the case of fuchsine; but while with the latter substance the red color disappears upon warming with ammonia, and is again produced upon acidulating with acetic acid, the red color imparted to amylic alcohol by vegetable red is changed to an evanescent violet by ammonia water. Upon agitation the coloring matter is withdrawn from the amylic alcohol, the latter becomes colorless, and the ammoniacal liquid assumes a brown-red or dark fire-red color; by the addition of acetic acid the liquid becomes almost completely decolorized. The red amylic alcohol solution leaves upon evaporation a fine red residue, which by ammonia vapors becomes transitorily violet. A red liquid known as "Teinte bordelaise," which has been introduced from France for the coloration of wine, was found to contain four per cent. by volume of alcohol, and to consist of the concentrated and fermented juice of the whortleberry.—*Ibid.*, p. 109, from *Ibid.*, p. 378.

On the Separation of Nickel from Cobalt. By G. Vortmann.—The author describes a method for the detection of nickel and cobalt, which in many cases is more accurate and more readily executed than the methods of Fischer and Liebig, It consists in the varying behavior of an ammoniacal nickel and cobalt solution toward sodium hypochlorite. From the liquid which has been treated with this oxidizing agent, and diluted with water, potassium hydrate precipitates only the nickel as hydrate, whilst cobalt remains in solution.—*Ibid.*, No. 19, 1883, p. 282, from *Ber. Akad. Wien.*, 1882, p. 270.

Studies Relating to Veratrine. By Dr. Emil Bosetti.—As the start-

ing point for his exhaustive research, the author selected the so-called officinal veratrine, which is said to be completely soluble in ether. The following results were obtained:

1. The pure officinal veratrine consists of a very homogenous, externally amorphous mixture of two isomeric alkaloids, having the formula $C_{32}H_{49}NO_9$, of which the one is crystallizable and practically insoluble in water—crystallized veratrine (cevadine of Wright and Luff),—the other uncrystallizable, but soluble in water. The latter is called by the author *veratridine;* it is identical with the soluble veratrine of Weigelin and E. Schmidt. Relatively small amounts of the first mentioned alkaloid suffice to render the latter insoluble in water, and on the other hand small amounts of the latter are sufficient to prevent the crystallization of the former.

2. By boiling with an alcoholic solution of barium hydrate, both of these alkaloids are split in the following manner: (*a*) Crystallized veratrine is decomposed into angelic acid and amorphous cevidine:

$$C_{32}H_{49}NO_9 + 2H_2O = C_5H_8O_2 + C_{27}H_{45}NO_9.$$

(*b*) Veratridine is decomposed into veratric acid and amorphous veratroine, according to the equation:

$$2C_{32}H_{49}NO_9 + 2H_2O = C_9H_{10}O_4 + C_{55}H_{92}N_2O_{16}.$$

The cevidine, $C_{27}H_{45}NO_9$, forms a yellowish-white powder, having an alkaline reaction and peculiar sweetish taste. Veratroine forms after drying and trituration a yellowish-white powder, the dust of which incites violent sneezing and coughing. It is sparingly soluble in water, but readily soluble in chloroform, ether, amylic alcohol, benzol and carbon bisulphide.—*Ibid.*, No. 24, 1883, p. 360, from *Arch. der Pham.*, 21, p. 81.

The Detection of Acetal. By M. Grodzki.—As acetal has recently found more frequent application for medicinal purposes, a method was desired whereby even small amounts might be detected.

Acetal is converted by acids, in aqueous solution, into aldehyde and alcohol, both of which in alkaline solution with iodine yield iodoform, while acetal itself is not thus affected. If, therefore, to a dilute aqueous solution of acetal a few drops of hydrochloric acid are added, and subsequently solution of sodium hydrate and solution of iodine, a dense, yellow precipitate of iodoform is produced.

The high molecular weight of iodoform renders possible the detection of even very small amounts of acetal.—*Ibid.*, p. 363 from *Ber. d. Deutsch. Chem. Ges.*, 16, p. 512.

On the Detection of Urea by means of Oxalic Acid. By E. Brücke.—The detection of urea may be very accurately effected if this body is finally taken up with amylic alcohol, and precipitated by a solution of oxalic acid in amylic alcohol. The crystals of oxalate of urea are usually small, but are better developed when the entire liquid is warmed until the crystals have dissolved and then allowed to cool. The amylic alcohol solution which is to be tested for urea may also be precipitated by a solution of oxalic acid in anhydrous ether. This latter mode of procedure would be adapted to its quantitative estimation, as the separation of the oxalate of urea thus proceeds very rapidly.—*Ibid.*, p. 364, from *C. Bl. med. Wiss.*, 1883, p. 139.

The Separation of Citric and Tartaric Acids. By C. Rovera.—The solution of the mixture of both acids is neutralized with sodium carbonate, the carbonic acid expelled by boiling, and the solution subsequently made slightly but perceptibly acid by the addition of a very small amount of the respective acid mixture. A solution of calcium chloride is then added, whereby the tartaric acid is completely separated, and from the filtrate the citric acid is separated as calcium citrate when the liquid is heated to boiling.—*Ibid.*, No. 26, 1883, p. 393, from *Giorn. Farm. Chim.*, 32, p. 60.

The Estimation of Mineral Oil in Fats and Resins. By A. Gawalowski.—Twenty grams of the fat or resin are saponified in a large porcelain capsule with a solution of fifteen to twenty grams of caustic potassa in 100 to 150 cubic centimeters of water, and the soapy mixture finally evaporated at a gentle heat to dryness. The soap residue is then dissolved in lukewarm water, the solution brought into a separating funnel, and, after cooling, shaken with ten to fifteen cubic centimeters of petroleum ether. After standing for six or eight hours the clear lower liquid is decanted, the petroleum ether layer is repeatedly washed with lukewarm water until a portion of the separated wash water no longer froths upon agitation, and the combined soap lyes decomposed with dilute sulphuric acid. The fatty acids which are thereby liberated are extracted with ether, and freed from the latter by evaporation. The original petroleum ether layer is allowed to evaporate at a gentle heat, dried over sulphuric acid or in an air-bath, and the residual mineral oil weighed.

Comparative experiments with known mixtures of mineral oils with saponifiable fats, afforded perfectly satisfactory results.—*Ibid.*, from *Rundschau and Wieck's Gew., Ztg.*, 48, p. 74.

Observations on Blue Milk. By J. Reiset.—The disease, which is presumed to be produced by bad ventilation, proceeds from a blue fungus, which attains a length of twenty millimeters, and may be suppressed by thorough purification of the vessels with boiling water, avoiding the use of brushes and cloths. Strongly infected milk is regenerated by acetic acid, to which purpose an acid consisting of one part of water to ten molecules $C_2H_4O_2$ is employed, and 0·5 gram of the acid added to one liter of milk.—*Ibid.*, p. 394, from *Compt. rend.*, 96, p. 682.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

An adulteration of Senega Root, with about 15 per cent. of the root of Ionidium Ipecacuanha has been noticed in France by Charbonnier. The latter root, which is one of the so-called false ipecacuanhas of Brazil, is greyish-white, in pieces about 5 to 6 centimeters long, and of the thickness of a goose quill; it is irregularly undulate, branched below, and above has small remnants of the ligneous stems; it is strongly wrinkled longitudinally, and irregularly fissured transversely; the bark is thin and adheres firmly to the thick meditullium, which is of a yellowish color.—*Jour. Phar. Chim.*, 1883, Jan., p. 40.

Delphinium Consolida, Lin.—E. Masing obtained from 5 kilos of the dried flowering herb about 1 gram of alkaloid, for which he proposes the name *calcatripine*, derived from flores calcatripæ, under which name the flowers were formerly officinal. The alcohol dissolved in one thousand parts of acidulated water, gave precipitates with the various group reagents for alkaloids; tannin yielded a faint turbidity after 24 hours; mercuric chloride, ammonium molybdate, and potassium bichromate had no effect. Sulphuric acid, sp. gr., 1·84 gave a red brown color, changing to violet brown, and after 24 hours to grey-brown. Fröhde's reagent colored olive green, becoming gradually deeper, then fading to grey-yellow. Sugar and sulphuric acid gave a red-brown color, slowly changing to greenish blue. Sulphuric acid followed by nitric acid or a nitrate, causes the red-brown color to change to orange-red, then orange-yellow, and finally golden yellow. The alkaloid, which was not quite pure, is soluble in alcohol, ether and chloroform, and appears to be easily decomposed by chemical agents.—*Phar. Zeitschr. Russ.*, 1883, W. 3.

Jequirity.—The seeds which have been recently introduced under

this name as a remedy in opthalmic complaints, are derived from Abrus precatorius, a leguminous plant, indigenous to Africa and Southern Asia, and naturalized in tropical America. The hard seeds have a bright red integument with a black spot surrounding the raphe. They are used in Oriental countries for ornaments and similar to beads; in Brazil they have been highly valued for several centuries in the treatment of certain diseases of the eyes, an infusion being made of 32 powdered seeds (about 3 gm.), which are macerated for 24 hours with 500 gm. cold water, after which 500 gm. of hot water is added, and, when cooled, the liquid is filtered.

The results obtained by L. de Wecker, show that this infusion produces conjunctivitis purulenta or cruposa as rapidly as inoculation, and that with due care, the desired inflammation may be well regulated. The experiments have not been concluded yet, and the active principle of the seeds is still unknown; an alkaloid prepared by Rigand & Dusart, did not give similar good results, whether used by instillation or subcutaneously.—*Phar. Centralhalle*, 1883, p. 145. *Klin. Mon. f. Augenheilkunde.*

Pongamia glabra.—Nat. Ord. Leguminosæ is a tree extensively diffused throughout Southern India, Malacca and the Indian Archipelago, and also found in Southern China and North Australia. It has smooth, imparipinnate leaves, composed of 5 or 7 egg-shaped or broadly elliptical leaflets, and loose axillary racemes of flowers. In India an oil called *pongamia* or *kurung oil* is expressed from the seeds and is described in most works on Hindu materia medica as being a favorite remedy amongst the natives for various skin diseases. The oil is of a deep yellow color, inclining to reddish-brown, and is fluid at temperatures above 60° F., but below that it becomes solid. Surgeon-Major Dymock, of Bombay, has recently called attention to the use of pongamia oil in pityriasis versicolor. Several cases occurring on the neck, face and shoulders were cured in less than a fortnight by rubbing in the oil twice a day. He concludes that it is likely to be of service in other skin diseases which, like pityriasis, are attended by the growth of a fungus. Dr. Dymock considers this oil much more effective than acetic acid, while it has the advantage over iodine and Goa powder of not discoloring the part (often the face) to which it is applied. Dr. Thin has recently stated that sulphur ointment is an admirable remedy for ringworm, but pogamia oil might be used in cases where the disease is of a recurrent character.—*Wm. Elborne, in Phar. Jour. and Trans.*, 1883, Feb. 24th, p. 688.

Constituents of Kino.—A. Kremel has examined Malabar kino, Butea gum, Eucalyptus kino, and kino from Coccoloba uvifera, and found them all free from kinoin discovered by Etti, (see *Amer. Jour. Phar.*, 1872, p. 600); instead of a body acquiring like kinoin, a red color with ferric chloride, protocatechuic acid was obtained, alone or mixed with gallic acid.

The presence of pyrocatechin in kino has been observed by Eichstedt, Flückiger, and others (see *Amer. Jour. Phar.*, 1872, p. 210). Preusse ascertained that pyrocatechin is extracted by ether from an alkaline solution, while for the extraction of protocatechuic acid, the solution requires to be acidulated. Following this process, Kremel proved the absence of pyrocatechin from the above named varieties of kino; the ether residue was amorphous, insoluble in hot water and the alcoholic solution without action on ferric chloride. But from the acidulated solution of Malabar and eucalyptus kino, ether took up a crystallizable body, of acid reaction which in aqueous solution, like pyrocatechin was colored green by ferric chloride; sodium bicarbonate added to this caused a violet color; the crystals were, therefore, protocatechuic acid.

Butea gum and coccoloba kino treated in the same manner yielded crystals of neutral reaction, becoming green by ferric chloride, but on the further addition of sodium bicarbonate, ferric hydrate was precipitated. The nature of these crystals could not be determined for want of material.

The different kinds of eucalyptus kino examined, yielded from ether, besides protocatechuic acid, also a body the aqueous solution of which acquired after the addition of sodium carbonate, gradually an emerald green color, which on the addition of hydrochloric acid turned red and finally became decolorized; these reactions prove the presence of gallic acid.

On preparing kinic red by Etti's process from eucalyptus kino, extracting the product with ether, fusing it with caustic potassa, dissolving in water, acidulating and extracting with ether, Kremel obtained considerable amount of protocatechuic and gallic acid.—*Phar. Post*, 1883, No. 11.

Mullein Leaves in Pulmonary Consumption.—The leaves of Verbascum Thapsus are popularly used in Ireland, in consumption, and the plant in addition to growing wild, is cultivated in gardens, occasionally on a rather extensive scale. The mullein is administered by boiling an ounce of the dried leaves or a corresponding quantity of

the fresh ones, in a pint of milk for ten minutes, and giving the strained liquid warm, with or without a little sugar. From his observations, Dr. F. J. B. Quinlan regards mullein as having a distinct weight-increasing power in early cases of pulmonary consumption. The hot decoction causes a comfortable sensation, and when patients take it they experience a physiological want for it. It eases phthisical cough, some patients scarcely requiring cough medicines at all. Its power of checking phthisical looseness is very marked, and it also gives great relief to the dyspnœa; but for phthisical night sweats it is utterly useless. In advanced cases it does not prevent loss of weight.

The decoction in milk is liked by the patient; in watery infusion it is disagreeable, and the expressed juice preserved by glycerin still more so.—*Brit. Med. Jour.*

Assay of Nux Vomica.—W. R. Dunstan and F. W. Short, have found the following process a satisfactory one: One part of nux vomica is made into a paste with a solution of two parts of crystallized sodium carbonate, the mixture dried over a water-bath and powdered; the powder equal to five grams of nux vomica is packed in a suitable extraction apparatus and exhausted by 40 cc. of chloroform containing 25 per cent. of alcohol. This is usually accomplished in one or two hours. The solution thus obtained is well agitated with 25 cc. of a 10 per cent. solution of sulphuric acid. The separation of the chloroform is much aided by gently warming the mixture on a water-bath. After repeated agitation the chloroform is separated by means of a funnel and again shaken with 15 cc. of dilute sulphuric acid. The mixed acid solutions from which all the chloroform has separated, should be filtered if necessary, then made alkaline with ammonia and shaken with 25 cc. of chloroform in a separating funnel; the clear chloroform solution is evaporated over a water-bath to a constant weight and then weighed. The amount of mixed alkaloids thus obtained from five samples was 2·92, 3·57, 3·32, 3·38, and 2·56 per cent.—*Phar. Jour. and Trans.*, 1883, Feb. 17, pp. 665, 666.

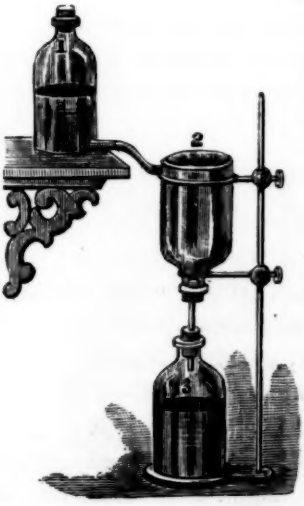
Colchicine has been obtained well crystallized by Dr. S. Zeisel. In a communication to the Austrian Academy of Sciences the author states that the crystals were obtained from a chloroform solution; the solvent adhering persistently to them, it is not impossible that the crystals may be a compound with chloroform, though their aqueous solution possesses all the characteristic properties of colchicine.

In preparing colchiceine from colchicine, the author obtained a new base, *apocolchiceine*, which has both basic and acid characters. It may be obtained in larger quantities, besides methyl chloride, on heating colchiceine with hydrochloric acid; and on increasing and continuing the heat, another substance is obtained having acid properties.—*Phar. Post.*, 1883, W. 10.

Formic and Acetic Acid in Plants.—From a series of experiments made with thirty-five plants belonging to different groups, Emil Bergmann concludes that these two acids are constantly present in the protoplasm of the different parts of plants, those containing chlorophyll, as well as those which are free from it; that most likely propionic, butyric and other volatile fatty acids are likewise widely distributed in the vegetable kingdom; and that these acids are formed as products of decomposition from certain constituents of the vegetable protoplasm in growing plants.—*Chem. Centralblatt*, 1883, W. 12.

SIMPLE APPARATUS FOR MAKING ETHEREAL TINCTURES, ETC., BY PERCOLATION.

By John Calvert.



Vessels 1 and 2 are ordinary quart douche bottles; No. 3 is a common quart flask; Nos. 2 and 3 are fitted with corks through which one piece of glass tube is passed.

No. 1 is the reservoir; No. 2 is the percolator; No. 3 is the receiver.

The lower orifice of No. 1 is connected with No. 2 by means of a short piece of vulcanized rubber tubing.

The receiver is marked to indicate a pint.

To make a pint of ethereal tincture of cantharides, or blistering liquid, sixteen troy ounces of powdered cantharides are put into the percolator; a plug of tow is inserted in the neck, followed by the cork carrying the glass tube. The bottle is inverted and its contents packed as closely as possible, by gently slapping the sides of the

vessel with the hand. The side orifice near the bottom of the percolator is then connected with the reservoir by means of the rubber tube. The reservoir stands on a shelf; the percolator is supported by the rings of a retort stand. The cork of the receiver is first slipped on to the glass tube of the percolator, and then brought down into the neck of the receiver. This cork should have a small escape-hole in it. The apparatus is now ready.

The ethereal mixture, consisting of a pint of rectified ether and three ounces of acetic ether, is poured into the reservoir, and the cork inserted. The flow is determined by raising the cork of the reservoir from time to time. When the ethereal liquid has completely permeated the powder, the supply of ether is stopped. The drug should be allowed to macerate for a few hours, after which the percolation may proceed, drop by drop. A pinch-cock on the rubber tube will regulate the flow. As soon as the reservoir is emptied, half a pint of alcohol is poured in, and, when again empty, water is employed to finish the displacement.

If a steady stream of the menstruum is desired, a small piece of glass tube is passed through the cork of No. 1, and connected, by means of rubber hose, with a similar piece through the cork of No. 3. Equilibrium is thus maintained.

The exhausted powder may be removed from the percolator by means of a stream of water, which is injected through the smaller orifice by the aid of a hose attached to the faucet of the water supply. —*Proc. Cal. Phar. Soc.*, 1883, p. 40.

PRACTICAL NOTES FROM VARIOUS SOURCES.

By the Editor.

Potassium Chlorate and Glycerin..—Fred. Grazer observed that a mixture of saturated solution of potassium chlorate (1 to 16) and glycerin, remains clear for a short time only, and then deposits crystals of the chlorate unless a small portion of water is added.—*Proc. Cal. Phar. Soc.*, 1883, p. 50.

Liquor Laccæ albæ is recommended by S. A. McDonnell as a "label preserver," it forming a colorless varnish suitable for the protection of labels on jars and bottles which do not contain strong alcoholic liquids. It is made by dissolving 1 ounce of white shellac in moderately fine powder in half a pint of ether, agitating the solution with 4 drachms

of lead carbonate and filtering through paper, returning the first portions of the filtrate until it passes perfectly clear. Ordinary shellac may be used, but it imparts a brownish color to the labels. The varnish dries rapidly, and after two or three coats are applied is smooth and so hard that the warmth of the hand makes no impression on it. —*Ibid.*, p. 43.

Castor Oil Soap for Linimentum Saponis comp., has been repeatedly recommended (see *Amer. Jour. Phar.*, 1872, p. 529). M. S. Hammer gives the following formula for preparing the soap: Saponify castor oil Oii with caustic potassa ℥vi and water Oii by heating until a transparent mixture is obtained, then add a saturated solution of 8 ounces of sodium chloride, stir until cool, allow to subside for a day, decant the liquid portion, cut in pieces and dry for use.—*Proc. Cal. Phar. Soc.*, 1883, p. 50.

A Troublesome Ointment.—S. A. McDonnell found great difficulty in preparing an ointment ordered to be made from extract. eucalypti, extract. hydrastis, extract. iridis versic. *aa* ℥i, ung. petrolei ℥i. The extracts were softened with water, with alcohol of 25 and 50 per ct., and with alcohol, but a presentable ointment could not be made until to the extracts of the last experiment a portion of glycerin was added and heat applied, until all the alcohol and water were evaporated; the extracts were then smooth and soft, and on being added to the petrolatum made a perfect ointment.—*Ibid.*, p. 44.

Naphthol in Ointments.—Commercial naphthol when used in ointments undergoes a decomposition, a brown oil being separated. To avoid this, Causse proposes the purification of naphthol, which is powdered and for several hours treated with chloroform, in which liquid it is insoluble; the chloroform solution is afterwards decanted or filtered, and the naphthol fused until the odor of chlorofrom has disappeared.

Unguentum Naphtholi, as used by Prof. Hardy, is made of 1 part of naphthol and 10 parts of petrolatum. The naphthol is dissolved in its own weight of ether, one-third of the petrolatum is added, and the mixture heated in a water bath to expel the ether, when the semi-liquid mass is mixed with the remaining petrolatum.—*Jour. Phar. Chim.*, 1883, Feb., p. 143.

The acid reaction of the gastric juice, according to Dr. V. Poulet, is due to acid hippurate of potassium, which is associated or combined with neutral calcium and sodium phosphates. These salts may be recognized by their shape under the microscope, and when the gastric juice

is dialyzed, the dialysate carefully evaporated, the residue treated with an excess of potassa or lime and then subjected to dry distillation, the odor of benzol is plainly developed.—*Jour. Med. Paris*, 1883, Jan. 27.

Strychnine Sulphate.—The French Codex of 1866 orders the normal sulphate containing $7H_2O$ and corresponding with the formula determined by Regnault in 1838. The correctness of this formula was doubted by Schabus (1855), and subsequently Des Cloizeaux and Rammelsberg prepared hydrates of strychnine sulphate, containing 5, 6, and $6\frac{1}{2}$ H_2O. Lextreit has recently examined numerous samples of the salt as it is met with in French commerce, and found that the normal and acid sulphates are used indiscriminately. He obtained the acid sulphate with 2 H_2O in short needles, at an elevated temperature, and in thin needles several centimeters long, when evaporated at a low temperature. Owing to its caustic properties it is not suited for medicinal use, more particularly not for subcutaneous injections.

The normal sulphate with 5 H_2O is obtained from strychnine 10 parts, pure sulphuric acid 1.27 parts, and alcohol 50 parts, using a moderate heat for dissolving, the salt is soluble in 75 parts of alcohol. Using a somewhat diluted alcohol, large prismatic crystals are formed, but when the strength is reduced to below 50 per cent., the salt is mixed with the hydrate containing 6 H_2O, crystallizing in square plates. The latter is obtained by replacing the alcohol in the above directions with 35 parts of water and crystallizing at 70°C; above this temperature a mixture of the two hydrates may be obtained. The author prefers for medicinal use the salt with 5 H_2O, because it is uniformly procured from the solution in strong alcohol.—*Jour. Phar. et Chim.* [5], vi, p. 259. See also *Amer. Jour. Phar.*, 1883, pp. 114, 115.

Solution of ergotin for hypodermic use is made by Dannecy, of Bordeaux, as follows: Bruised ergot is freed from oil by carbon bisulphide and afterwards displaced with cold distilled water, the liquid is evaporated to about one-third its volume, when cool filtered from the albuminous matters and treated for 24 hours with well-washed animal charcoal at a temperature of from 25 to 30° C., when it is cooled, filtered, the charcoal washed with distilled water and the decolorized filtrate evaporated over the water bath until for every 100 parts of ergot used, 90 parts of liquid remain; 10 parts of cherry laurel water are then added, and after cooling, the liquid is filtered.

This solution is of an amber color, has a strong acid reaction upon litmus paper, has been found to be quite active and innocuous, and

keeps unaltered for a long time. By further concentration in the water bath it may be obtained of double or triple the strength recommended above.—*Bull. Gén. de Thér.*, 1883, March 15, p. 214.

Caustic Pencils of Sulphate of Zinc are best prepared, according to G. Vulpius, by melting in a small porcelain capsule, the crystallized salt in its water of crystallization and pouring the fused mass rapidly into conical moulds made of waxed paper. Ordinary paper is unsuitable for this purpose, since it becomes firmly attached to the pencil.—*Phar. Zeitung*, 1883, W. 17.

Preparation of Pyroxylin.—G. Wolf recommends the following process which yields with ether-alcohol a perfectly clear and colorless solution: 20 parts of crystallized potassium nitrate are triturated in a mortar, 36 parts of a sulphuric acid sp. gr. 1·84 are added, and when the mixture has cooled one part of cotton is incorporated with the pestle so as to be uniformly impregnated; after ten minutes the cotton is placed upon a laterally preforated funnel, this is dipped into water and the water is removed until it ceases to acquire an acid reaction.

J. Bienert operates with a mixture of 6 fluid ounces each of sulphuric acid sp. gr. 1·84, and nitric acid sp. gr. 1·41 to 1·42; when the mixture has cooled to between 20° and 25° C., 6 or not more than 7 drachms of clean cotton are introduced and the mixture, which is stirred once a day, is set aside from five to eight days at a temperature of 15° to 20° F. The sufficient nitration is observed by the change of the parchment-like appearance of the cotton, and by its becoming soft again, but it is advisable to ascertain its solubility from a sample taken. This gun cotton gives a strong cuticle and its solution in ether-alcohol is not precipitated by ether.—*Phar. Zeitschr. Russl.*, 1883, p. 4.

Preparation of Asparagin.—A precipitant for asparagin has hitherto been unknown. E. Schulze recommends mercuric nitrate which causes a white precipitate in aqueous solutions of asparagin, and this principle is liberated on decomposing the precipitate with sulphydric acid. This behavior is serviceable for the preparation of asparagin from vegetable extracts.—*Berichte*, 1882, p. 2855.

Purification of Storax.—Benzol used for this purpose has many disadvantages, such as inflammability of the vapors, its disagreeable odor, the high temperature at which it volatilizes completely, and its yellow color as frequently found in commerce. Schlickum proceeds as follows: 100 parts of storax are gently heated, 10 parts of alcohol

are stirred in, the mixture is allowed to cool, an equal volume (about 60 to 70 parts) of ether is added and this mixture passed through a covered plaited filter, the residue is washed with a little ether and the filtrate is either distilled to recover the ether, or evaporated spontaneously, and finally by the aid of a water bath until the odor of ether has disappeared. Good storax yields 70 to 75 per ct. of purified product. This process is also much to be preferred to the purification with hot alcohol.—*Phar. Zeitung*, 1883, No. 22.

Syrupus tolutanus.—Malenfant gives the following process as yielding the best results: The white of one egg is well beaten and mixed with 1000 gm. of water and 250 gm. of tincture of tolu. This mixture is added to a mixture of 10 kilos of granulated sugar and 5 kilos of water, and the whole then rapidly heated to boiling, without removing the scum; finally, when clear, the syrup is strained or filtered.—*Rundschau*, 1883, W. 7, from *Jour. de Phar. et de Chim.*

Lupulin and Camphor are not readily made into a plastic mass by excipients without increasing the size of pills very considerably. But with the addition of a small quantity of ether, a very serviceable mass is obtained, which without any other addition may be made into very small pills. Such pills should be made in moderate quantities only, sufficient to last about a week.—*Ibid.*, W. 10.

For Masking the odor of Musk, Prof. Wiesenthal uses hydrochloride or sulphate of quinine, whereby the musk becomes inodorous. For removing the penetrating musk odor from the hands, it is sufficient to put a little quinine in the palm of the hand, moisten it with acidulated water and rubbing the hands.—*Phar. Post*, 1883, p. 73.

Vanadium Ink.—Vanadium tannate was proposed for use as writing ink by Berzelius, because the writing is not affected by acids, but the high price of vanadium salts was a great obstacle to its introduction. Since these salts have been more largely prepared for use in the manufacture of anilin black and other dyes, vanadium ink is again proposed. Dr. Siemens gives the following formula: Tannin 10 gm., ammonium vanadate 0·2 gm., water 200 gm., and gum arabic 6 gm. Bœttger proposed pyrogallic acid and ammonium vanadate, which yields a blue-black liquid free from any precipitate, as a good ink; however, Dr. E. Geissler found the writing with this ink to change to yellowish brown in a short time. Extract of logwood and ammonium vanadate yield likewise an excellent ink.—*Phar. Centralh.*, 1883, p. 148.

DISINFECTANTS.

By. R. Koch.

The mode of action of individual disinfectants has not been sufficiently investigated, because of our incomplete knowledge of the infectious matter. An *efficient disinfectant* ought, in the author's opinion, to kill all living organisms and render all germs innoxious within twenty-four hours. To test a disinfectant thoroughly, its action must be tried on all disease-producing matter, and under conditions exactly similar to those in which it is used in practice. Thus a disinfectant which does not kill fungi would be of no use in contagious skin diseases, whilst one which did not destroy bacteria would be inefficient in diseases caused by these organisms. The author has investigated the action of disinfectants on bacteria. In these experiments, he has taken great care in the cultivation of bacteria, selecting those which are seldom found in the air. Experiments on the development of bacteria were made on solid nutritious substances. The chief points observed are—1. If all the organisms are killed. For this it is sufficient to note the action on the most persistent, viz., the bacilli spores. 2. The facility with which the development of micro-organisms in favorable nutritive solutions is prevented.

Carbolic acid is almost without action on spores of *Anthrax bacilli*, *e. g.*, the bacilli spores retained their vitality after being five days in a 2 per cent. solution, and in another experiment fifteen days in a 1 per cent. It is, however, destructive to the living micro-organism, for 1 gram of pure carbolic acid can completely prevent the development of *Anthrax bacilli* in 850 cc. of a nutritive solution, and even shows a marked effect in 1250 grams. Its action on other bacteria is less marked. Carbolic acid in the form of vapor does not effect the germinating power of bacilli spores at the ordinary temperature, even after being in contact with them 1½ months, but at 55°, in half an hour many of the spores are destroyed, in three hours scarcely any germinating power is discernable, whilst after five or six hours their destruction is complete. Raising the temperature does not increase the activity. Carbolic acid vapor can only be conveniently used for small objects.

The above results are obtained with aqueous solutions of carbolic acid. Solutions in oil or alcohol do not show any antiseptic properties; this is also the case with other disinfectants, *e. g.*, salicylic acid, thymol, etc., except when they are used with substances containing water, such as flesh, etc., when some of the disinfectants become active.

Sulphurous acid, either alone or mixed with water or steam, does not disinfect dry objects. If, on the other hand, the object is first moistened with sulphurous acid and then treated, brisk action is observed; it does not, however, destroy all germs. Its disinfecting action is thus uncertain, and is not to be depended on.

Amongst many others, *zinc chloride* and *glycerol* are proved to be without effect. In fact the only *effective disinfectants* (see above) besides *chlorine*, *bromine*, and *iodine*, are *corrosive sublimate*, *osmic acid*, and *potassium permanganate*. The last mentioned only acts in strong solutions (5 per

cent.). Bromine and osmic acid are too expensive. Corrosive sublimate is very poisonons; its action, however, is so very quick that it could be used for solid substances, which could then be washed well with water.

Substances effective in checking the germination of spores are corrosive sublimate, some essential oils, thymol, and amyl alcohol.—*Jour. Chem. Soc.*, 1883, 249. *Chem. Centr.*, 1882, 509, 512.

INFLUENCE OF THE ELECTRIC LIGHT ON THE DEVELOPMENT OF PLANTS.

By P. P. Deherain.

The author's experiments were made at the Palais d'Industrie during the Electric Exhibition of August, 1881. A greenhouse was constructed and divided into two compartments, one of which was glazed with blackened perfectly opaque glass, whilst the other was exposed to the ordinary diffused daylight of the Exhibition building. The darkened chamber was illuminated continuously, night and day, by a 2000-candle arc-light from a Gramme machine, driven by an Otto gas-engine. The transparent chamber was illuminated at night only by the electric light. Five series of comparative observations were made, viz.:—

1. Plants exposed night and day to the electric light alone.
2. Plants exposed during the day to the diffuse daylight of the Palais, and during the night to the electric light.
3. Plants living during the day in the open air, and receiving the electric illumination at night.
4. Plants passing the day in the diffuse daylight of the Palais, and the night in darkness.
5. Plants living normally in a garden.

The plants submitted to experiment were barley, flax, beans, and a number of garden and greenhouse plants.

Action of the Unprotected Light.—At the end of seven days the naked electric light was seen to have an injurious effect both on those plants which were constantly subjected to it, and in a less degree on those which were exposed to it during the night only. The leaves blackened, withered, and dropped off; the injury was confined to the epidermal layers, and was due to the direct impact of the luminous radiations (and not to the formation of nitrogen oxides); for where one leaf was partly shaded by another, a sharp line was photographically impressed.

Experiments on *Elodea canadensis*, submerged in flasks of water, showed that whilst the diffuse daylight of the building was unable to cause decomposition of carbonic anhydride and evolution of oxygen, the direct rays of the electric light were able to do so, about as much oxygen being obtained during an exposure of four or five days and nights to the electric light as could be obtained in an hour or so in bright sunlight. At the end of 15 days the arc-lights were enclosed in globes of transparent glass. Siemens' just published experiments having shown that the injurious action of the direct radiations was thereby modified.

Action of the Protected Light.—A number of fresh and uninjured plants were placed in the greenhouse, and in addition sowings of barley, oats, peas, maize, beans, which had just appeared above the ground. All the seedlings exposed exclusively to the electric light perished sooner or later, and the leaves of some of them were blackened as with the naked light. The mature plants, on the other hand, continued to vegetate, but in no case, save a plant of barley, were flowers and seeds produced, the vegetation being purely foliaceous. The barley grains were normal, and germinated on being sown. The electric light employed was clearly insufficient by itself to determine the assimilation of any considerable quantity of material; direct experiments also proved that it is not more powerful in exciting transpiration of water, a leaf exposed to it giving off in an hour only about one-fiftieth of the quantity of water evaporated under similar circumstances in sunlight. As the evaporation of water by the leaves is one of the chief agencies in causing the migration of material necessary for the maturation of seed, the failure of the plants to produce flowers and seeds receives its explanation. It is known that yellow and red rays are most powerful in causing transpiration, whilst the electric light is particularly rich in blue and violet rays. The author considers the electric light employed as too feeble to allow of any conclusion as to the necessity of a nocturnal rest to plants. It was, however, evident that the electric illumination during the night was advantageous to those plants which passed the day in the rather feeble diffused daylight of the palace. In a third series of experiments, the intensity of the electric light was practically augmented by placing the plants near the lamp. The experiment was again fatal to young seedlings receiving the electric light exclusively, but many of the hardier and more mature plants survived, although the leaves of some were blackened by their too great proximity to the light; and again the nocturnal electric illumination was decidedly favorable to the plants which passed the day in the light of the palace. The author sums up his conclusions thus:—

1. The electric arc-light emits radiations which are injurious to vegetation.
2. Most of these radiations are arrested by colorless glass.
3. The electric light emits radiations powerful enough to maintain mature plants in vegetation for two months and a half.
4. The beneficial radiations are not sufficiently powerful to cause the growth of germinating seeds, or to allow of the maturation of fruit in older plants.—*Jour. Chem. Soc.*, 1883, 105. *Ann. Agronom.*, vii, 551–575.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, April 16, 1883.

In the absence of the president, Mr. Alonzo Robbins was called to the chair.

The minutes of the last meeting were read and approved.

The following donations to the library and museum were made: Proceedings of the American Pharmaceutical Association for the year 1882, from the

Association. From Mr. Henry Cramer, "Pharmacopœa Wirtembergica," published in 1786; an engraving of Dr. Pareira and one of Linnæus, and a specimen of oil of cajeput; said oil was presented to Capt. E. M. Donaldson by the Governor of Java in 1806, by him given to Mr. Cramer in 1852, and by the latter gentleman kept ever since. It is peculiar in being of a brown color and not the green shade which is characteristic of the oil of cajeput of commerce. From Messrs. Rosengarten & Sons, several Brazilian drugs marked as follows: *Abutua*, said to be a powerful tonic; *Herva Lanceta* and *Herva Capitad*, each supposed to contain morphine; *Pao pereira* (casca), very bitter and a powerful tonic: *Guaranham*, a very astringent bark used in Europe for making monesia.

Professor Maisch remarked that the small specimen marked abutua, was evidently the root and lower stem of a menispermaceous plant, closely related to or identical with pareira brava; the bark marked guaranham was identical with the bark which in European commerce is known as *cortex monesiæ* and is referred to Chrysophyllum glyciphlœum, *Casaretti;* the bark marked pao pereira was obtained from Geissospermum læve, *Baillon*, and contained two alkaloids, at least one of which had been found to possess toxic properties; herva lanceta was referred in a Brazilian book to Solidago vulneraria (author's name not given); herva capitad was probably identical with the *herbe capitaine* mentioned some time ago in a French journal, and referred to a species of Hydrocotyle, and to which diuretic and deobstruent properties were ascribed.

Professor Maisch exhibited a specimen of *lint* made by Messrs. Seabury & Johnson, who claim that it is the first American made lint, and that it is more absorbent, fluffier and lighter than any other make, can be torn readily, and is more reasonable in price.

Dr. Wolff, of the committee appointed in February, read two notes on *unguentum hydrargyri nitratis* and on *tincture of iodine* (see page 231), the experiments detailed therein having been made under his supervision. The communications were referred for publication and the committee was discharged.

Professor Maisch remarked that the specimens submitted on a former occasion, and another prepared by a member of the College did not attack iron spatulas, while those made by the committee corroded iron; this result might arise from a difference in the strength of the nitric acid.

Mr. Gustavus Pile, at the request of the meeting in March, exhibited *lactometers* and described the method of using them. The thanks of the meeting were tendered to Mr. Pile, and he was requested to embody his remarks upon milk examination in a paper for the Journal (see page 244).

Mr. Trimble stated that the cream did not always rise in six hours, but that in twelve hours the whole of the cream would rise to the surface; a slight addition of water to good milk would cause the cream to rise more rapidly, and thus, if examined in six hours, might induce the impression that the mixture of milk and water was better than the pure milk.

Mr. Thompson considered a simple method for testing the quality of milk to be greatly needed; the atrocity of its adulteration became apparent, when the extensive use of cow's milk as food for infants was considered, whose lives were endangered by diluted and otherwise adulterated milk.

Professor Maisch referred to forms of lactometer proposed some years ago, whereby the quality of milk was ascertained by the degree of opacity.

Professor Maisch read a paper by Mr. G. W. Kennedy, upon pharmaceutical preparations of the *stigmata of zea mays*, or corn silk (see page 242). He said that in his opinion the virtues of this drug would probably be found to reside in one or more varieties of sugar, as was the case with the rhizome of triticum repens; in his opinion corn silk lost far more than 50 per cent. of its weight on drying.

Mr. Robbins said that on drying one pound of fresh corn silk he obtained little more than one ounce; he knew that as good results had been observed with the dry as with the fresh article. Several members reported similar experience.

Mr. Henry Trimble mentioned a case of *spurious cream of tartar* which had been submitted to him for examination; its composition proved to be about 60 per cent. of gypsum, 10 per cent. of tartaric acid and 30 per cent. of alum; it was offered by a grocery firm.

The subject of ready made coated *quinine pills* was discussed, and the sense of the meeting was that it was the especial duty of apothecaries to prepare their own pharmaceuticals, pills, fluid extracts, tinctures, etc. In this connection Mr. Thompson read an abstract from a report published in the April number of the "Chicago Pharmacist," on the composition of ready made quinine pills, giving the quantities of the sulphates of quinine and of the other cinchona alkaloids.

Professor Maisch stated that he had not yet read the report and now merely wished to say, that he was surprised to find as the result of the analysis where no, or merely an insignificant, deficiency of weight was found, that the proportion of the other cinchona alkaloids to quinine varied to such an extent; it was well known that the quinine sulphate turned out by the same manufacturer must vary in this respect, but to what extent the quinine at present in the American market differed was not known; some light would probably be shed on this question by the analysis of a large number of samples which have been collected during the past six months. It should be remembered that crystallized quinine sulphate contains 8 molecules of water, or 2 per cent. more than is given in the Pharmacopœia, and that manufacturers furnish it with the full amount of water; pills made with such quinine would then apparently be 2 per cent. deficient. That the salt readily loses its water of crystallization was well known, and it was obvious, therefore, that to secure a uniform hydration, the Pharmacopœia should recognize the salt fully effloresced at the ordinary temperature, a plan advocated years ago by Kerner and others.

Mr. Trimble thought that this matter would be cleared up to some extent when the quinines of commerce were tested for the relative proportion of water contained therein, which was sometimes more than the 8 molecules assumed to be the normal quantity.

A *safety poison cabinet* was exhibited by Mr. B. H. C. Sandy. This apparatus was exhibited about two years since at one of the pharmaceutical meetings, and then fully explained.

On motion adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

MASSACHUSETTS COLLEGE OF PHARMACY.—The Commencement exercises took place in Huntington Hall, in the Institute of Technology, on the evening of April 25, when the President, Henry Canning, conferred the degree of Graduate in Pharmacy upon the following candidates.

Charles Reginald Abbot, *Phosphate of Sodium.*
William Poole Browning, *Geranium Maculatum.*
Charles Willie Cheney, *Fraxinus Americana.*
William Sylvester Flint, *Boro-Glyceride.*
John Henderson Greer, *Strychnos Nux Vomica.*
Horace Nathaniel Hooper (Certificate of Proficiency), *Bismuth and Sub-Carbonate of Bismuth.*
Henry Evelyn Kelsey, *Chloral.*
Samuel Meadows (Certificate of Proficiency), *Sanguinaria Canadensis and Preparations.*
Charles Willis Merritt, *Quinine Pills of the Market.*
Truman Theodore Reid, *Wines dispensed as "Officinal."*
Benjamin Le Roy Spiller, *Antiseptic Dressings.*
Harry Leonard Wardle, *Nux Vomica and its Preparations.*

Prizes consisting of books were presented in the Senior class for recitations, to J. C. Cutting and H. E. Kelsey, and for written examinations to W. P. Browning and T. T. Reid; in the Junior class, for recitations, to G. W. Koester and F. B. Twitchell, and for written examinations to F. E. Lovell and W. F. Greene. An address was made by Prof. J. F. Babcock, the valedictory address on behalf of the faculty, by Prof. E. Patch, and the valedictory address on the part of the students, by T. T. Reid.

THE LOUISVILLE COLLEGE OF PHARMACY held its first *public* Commencement at the Louisville Opera House, Friday evening, March 9. Prof. Vincent Davis, M.D. and Ed. Goebel, Ph.G. delivered the addresses in behalf of the College and Faculty. Fred. G. Hoefer, Ph. G., delivered the salutatory, and R. J. Fugua, Ph. G., the valedictory addresses in behalf of the graduating class.

The degree of Graduate in Pharmacy was conferred on the following gentlemen:

Robert A. Anderson, Paris, Tenn.
Philip Fisher, Louisville.
Robert Frick, Louisville.
R. J. Fugua, Eminence, Ky.
Frederick Hoefer, Louisville.
Frederick Johanbocke, Louisville.
William Kerr, Louisville.
Walter B. King, Waco, Texas.
Chas. Millheisler, New Albany, Ind.
L. C. Owings, Jeffersontown, Ky.
H. A. Pfafflin, Indianapolis, Ind.
Henry J. Rueb, Lafayette, Ind.
Jos. Waldauer, Greenville, Miss.
John Wolpert, Louisville.

A certificate of proficiency was awarded to John C. Cooper, of Louisville.

The honors of the class were divided between Walter B. King, of Texas, and Henry A. Pfafflin, of Indiana. Mr. King received the annual Alumni gold medal for highest general average in all branches, also a gold medal for best examination in Pharmacy. Mr. Henry Pfafflin received

the college gold medal for the best original thesis, and a copy of the National Dispensatory for second best general average in all branches; then a new Pharmacopœia for best examination in practical course; a new Dispensatory for best examination in Materia Medica, and a copy of Gray's Manual for best examination in Botany.

Twelve Juniors passed a successful examination into the Senior class, of whom James Dillworth received the Alumni prize, a copy of Flückiger and Hanbury's Pharmacographia, and Jacob Lichten an Attfield's Chemistry for best examination in chemistry.

The annual meeting of the Louisville College of Pharmacy was held at the College hall on Monday, March 12, 1883, a larger number of members being present than at any meeting since the organization of the school. The reports of the officers of 1882 were read, proving the school to be in a flourishing condition. The following officers were elected to serve during the ensuing year: President, Dr. Wiley Rogers; Vice Presidents, Prof. Emil Scheffer, J. W. Fowler; Recording Secretary, Fred. C. Miller; Corresponding Secretary, Otto E. Mueller; Treasurer, C. Tafel; Curator, Oscar A. Beckmann. Board of Directors, Prof. Emil Scheffer, Dr. Wiley Rogers, Prof. C. Lewis Diehl, Fred. C. Miller, C. Tafel, John Colgan, J.W. Fowler, R. J. Snyder, Prof. Ed. Goebel, O. A. Beckmann, Otto E. Mueller, and Jacob Flexner.

The following Professors were elected: Emeritus Professor of Materia Medica and Botany, Emil Scheffer, Sr.; Professor of Theory and Practice of Pharmacy, C. Lewis Diehl, Ph. G.; Professor of Chemistry, L. D. Kastenbine, M.D.; Professor of Materia Medica and Botany, Edward Goebel, Ph. G.

The School Committee is considering the advisability of changing the evening sessions of the school to afternoon sessions, and of making the attendance of the practical course compulsory.

THE LOUISIANA STATE PHARMACEUTICAL ASSOCIATION convened at its first annual meeting at the University of Louisiana, in New Orleans, on Monday, April 2, and concluded its labors on Wednesday. President, J. T. Thibodeaux presided, and Mr. Hiland Flowers acted as Secretary. Mr. A. K. Finlay welcomed the Association in a few well chosen words, and Mr. F. M. Brooks of Baton Rouge responded. In his annual address the President discussed the affairs of the Association, referred to the new Pharmacopœia, and the manner of its revision in the future, and urged the incorporation of the Association. He discussed the advantages of a National Retail Druggists' Association, showed the desirability of cultivating fraternal feeling with the sister associations, made an appeal for elevating the School of Pharmacy, now connected with the medical department of the University of Louisiana, to an equality with the Colleges of Pharmacy in other States, and in referring to the failure of the proposed pharmacy law, the steps to secure its passage were dwelled upon.

The different officers and committees presented their reports, showing in detail the work done during the year.

The officers of the preceding year (see "Am. Jour. Phar.," 1882, p. 327) were re-elected, but upon the Recording Secretary declining, the position was filled by the election of the Corresponding Secretary, Ben Lewis, of New Orleans, and the vacancy thus created by the election of C. L. Keppler, of New Orleans. Appropriate action was taken on the recommendations of the President, a resolution protesting against the copyrighting of common pharmaceutical names was adopted, and after the appointment of standing committees, and votes of thanks, the Association adjourned to meet at Baton Rouge, on the third Monday in May, 1884.

EDITORIAL DEPARTMENT.

OIL OF THYME.—At the Niagara Falls meeting of the American Pharmaceutical Association in 1882 Mr. Jos. L. Lemberger read a very instructive paper on the presence of thymol in oil of thyme, showing that this volatile oil as met with in commerce varies considerably in the percentage of this important constituent, and this was followed by an interesting discussion on this subject. This discussion as reported on page 618 of the published proceedings, it appears contains some inaccuracies. Thus Mr. Gregory is reported as saying that in Ontario a dark oil of thyme was distilled rrom the herb, and that from a sample of pure oil examined he got less than one per cent. of thymol. In a letter recently received, Mr. Gregory informs us that he did not make these remarks, and that he is not aware that any oil of thyme is distilled in Canada. The second remark attributed to him should be so corrected as not to convey the meaning that Mr. Gregory had made the experiment, but that the oil of thyme of known purity, which had been examined by Mr. Lemberger, yielded less than one (·84) per cent. of thymol; and since another (commercial) sample of oil yielded 38·75 per cent. of thymol, Mr. Gregory argued that pure oil of thyme must be expected to vary, probably on account of climate and soil, and that oil of thyme containing little thymol should not, for this reason solely, be regarded as having been deprived of it.

INTERNATIONAL PHARMACEUTICAL EXHIBITION.—The Secretary of the Vienna Executive Committee, Dr. Hans Heger, has informed us, that the committee has agreed to accept applications for space from American exhibitors also *after* April 30, the limit originally adopted. A circular in the English language has been issued containing the regulations, by which the exhibition will be governed and of which an abstract was given on page 221 of our last number.

THE AMERICAN MEDICAL EDITORS' ASSOCIATION will hold its next annual meeting in Cleveland June 5th and 6th, simultaneously with the meeting of the American Medical Association. Dr. N. S. Davis, of Chi-

cago, will deliver an address on "The Present Status and Tendencies of the Medical Profession and Medical Journalism," and Dr. Marcy upon "Journalism devoted to the protection and concentration of Medical and Surgical Science in special departments."

THE PHILADELPHIA HOSPITAL FOR SKIN DISEASES has had added to its former facilities a complete system of baths for the general and specific treatment of these affections. The clinics are open to students, and the course of instruction is made more comprehensive by didactic lectures.

CORRECTION.—Page 212, line 5 from bottom, read L. C. (instead of J. E.) Leonhard.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Dispensatory of the United States of America. By Dr. G. B. Wood and Dr. Franklin Bache. Fifteenth edition. By H. C. Wood, M.D., Professor of Materia Medica and Therapeutics, etc., in the University of Pennsylvania; Jos. P. Remington, Ph. G., Professor of Theory and Practice of Pharmacy in the Philadelphia College of Pharmacy, etc., and Samuel P. Sadtler, Ph. D., Professor of Chemistry in the Philadelphia College of Pharmacy and in the University of Pennsylvania. Philadelphia: J. B. Lippincott & Co., 1883, pp. 1928.

During the past fifty years, in which time fourteen editions of it were published, this work has become familiar to most physicians and druggists in the United States. The changes adopted in the recent edition of the pharmacopœia necessitated a corresponding change in the arrangement of this dispensatory. In consequence of the abandonment of the division into Materia Medica and Preparations, Part II, as contained in the former editions, has been merged into Part I, so that as in the present pharmacopœia, all officinal articles are considered in the alphabetical order of their Pharmacopœial names. The arrangement of the matter under the individual headings remains in the main, as formerly; but the matter itself has of necessity undergone considerable modification, so as to embody the results of the recent scientific investigations and practical observations. These changes are more particularly noticable in that portion of the text relating to the chemistry of the drugs and preparations. For the preparation of chemical compounds, formulas for which have been omitted from the pharmacopœia, the process as detailed by the British Pharmacopœia has as a rule been retained in the text, besides brief outlines of other technical or interesting processes, while those contained in the old United States Pharmacopœia are usually given in foot notes.

The numerous changes and improvements in strictly pharmaceutical preparations have likewise received deserved attention and necessitated the rewriting or augmentation of most commentatory notices, in which the parts by weight as now directed by the Pharmacopœia are translated into

convenient definite weights and measures approximately. A separate chapter on Pharmaceutical Manipulation, which heretofore formed the introductory portion to Part II, has been very properly discontinued, and the matter incorporated in those places where it naturally belongs; most of it will be found in a much modified and improved form in the general remarks on extracts and fluid extracts. It should be mentioned yet, that for the first time, illustrations of a limited number of drugs and microscopical sections of drugs have been admitted.

That the medical properties and uses of the drugs have been treated of in the light of modern observation and views, was to be expected; the doses are stated in apothecaries and metric weights and measures.

Part II of the present work is essentially Part III of the former editions; it contains most of the non-officinal drugs and chemicals, comparatively few of which are noticed among the pharmacopœial articles.

What is now designated as Part III is the "Appendix" in former issues, modified of course, and with new matter added; in this part are to be found tables showing the composition of most American and of a number of European mineral waters.

The index has been likewise rendered more complete by embodying in it also the French, German and some other synonyms.

Therapeutic Handbook of the United States Pharmacopœia, being a condensed statement of the physiological and toxic action, medicinal value, methods of administration and doses of the drugs and preparations in the latest edition of the United States Pharmacopœia, with some remarks on unofficinal preparations. By Robert T. Edes, A.B., M.D., (Harvard), etc. New York: Wm. Wood & Co., 1883. 8vo, pp. 397.

The arrangement of this work is alphabetical, and the different remedies therefore, are considered in precisely the same order as in the pharmacopœia. It gives the physiological action of the remedies, considers their medicinal value, and states the dose in which they are given, and suitable methods of administration. A small number of unofficinal drugs are similarly treated in an appendix. The doses are indicated in apothecaries weights and measures, as well as in the metric system. The "Handbook" is well printed and makes a handsome volume.

A Manual of Chemical Analysis as applied to the Examination of Medicinal Chemicals. A guide for the determination of their identity and quality, and for the detection of impurities and adulterations. For the use of pharmacists, physicians, druggists, manufacturing chemists, and pharmaceutical and medical students. Third edition, thoroughly revised and greatly enlarged. By Frederick Hoffmann, A. M., Ph. D., public analysist to the State of New York, and Frederick B. Power, Ph. D., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Philadelphia: Henry C. Lea's Son & Co., 1883. 8 vo, pp. 624.

It is just ten years since this work was first published, and as is well known, great activity has prevailed in chemistry during that period, and since the medicinal use of definite compounds is continually increasing, the improvements in the processes, methods, and products of chemistry have necessarily had a decided influence upon pharmacy, increasing the demands

made upon the knowledge, judgment, and practice of the pharmacist. The field being thus very materially enlarged, the demands upon a work of this kind must obviously increase, the more so when the recent publication of the new U. S. Pharmacopœia, with its greater precision in the determination of the purity of chemicals is taken into consideration, and when it is remembered that also a new German Pharmacopœia has made its appearance, which is not unfrequently consulted in this country.

For these reasons it was to be expected that the new volume would be materially larger, but an increase in size merely is of itself no indication of increased value. On proceeding, however, to the closer examination of the contents, we soon begin to realize that the work has not only been enlarged, but likewise improved and again brought up to the present state of chemical knowledge.

The general plan of the work has undergone no change, the first part containing as heretofore, a description of the operations and reagents, together with full and detailed schemes of qualitative and volumetric analysis, while the second part is devoted to the medicinal chemicals, their properties and tests. Much of the first part has been rewritten, new methods have been added, as well as a large number of woodcuts in illustration of apparatus and operations, and a chapter on alkaloids has been appended, giving their general characters, more particularly their behavior to the various group reagents, and a method for the systematic separation and recognition of the important alkaloids and several allied principles.

Numerous additions of chemical compounds have been made to the second part, and these, like the others, are considered first in relation to their physical and chemical properties, including the characteristic tests of identity, and next in relation to the accidental impurities or intentional adulterations that are likely to be present, the operations for their detection being minutely described. References to the analytical examinations described in other parts of the work, have been made in a few exceptional cases only, each article being thus rendered complete in text as well as illustrations. In connection with most of the poisonous chemicals, the methods are also given for their separation, recognition and estimation in forensic investigation.

An addition has also been made to the tables, namely, one for the conversion of metric measures of capacity into United States fluid measure, and the reverse.

Viewed in regard to its general aims as well as to the manner in which they have been carried out, the work will be found as complete as can well be desired. The descriptions of operations are full without being redundant, so that the tyro can easily understand them, and practice the processes successfully; at the same time the details are not given with such minuteness and prolixity as to become wearisome, alike to the adept and the student. The same moderation is met with also in the descriptions and examinations of the individual compounds, and a work is thus presented, well adapted as a book of reference for practical use, and calculated to impart such information as in each particular case may be useful, or required within the limit of its objects. A freshness is thus preserved for the book, even after it has been frequently used, which renders it the more valuable by long acquaint-

ance. The external getting up of the book leaves nothing to desire, but since we have alluded above to the cuts of apparatus and operations, we should especially mention also the numerous well-executed cuts of crystals which serve to explain the shape far better than lengthy descriptions.

An Introduction to Analytical Chemistry. By Dr. John Muter, M.A., F.C.S., etc. Third edition. Philadelphia: Presley Blakiston. 8vo, pp. 216. Price $2.50.

This volume is a reprint of the practical portion of the author's work on pharmaceutical and medical chemistry; it is issued separately for convenience in use and is arranged on the principle of the course of laboratory instruction at the South London School of Pharmacy. As a work intended for practical use in the analytical laboratory it has its merits, which are to be found in the conciseness and the general correctness of the statements. If intended for students who have already mastered theoretical and synthetical chemistry, the greater portion of the first chapter might have been omitted without disadvantage. But if it is intended for the use of tyros, who have had little or no instruction in practical chemistry, we have serious doubts concerning its usefulness for imparting solid knowledge, except under the constant supervision of a competent teacher. Thus for instance in the chapter on gravimetric quantitative analysis, the solutions are supposed to contain only a single metal, and methods of exact separation are not given, while the methods as given in Chapters II and V apply nearly all to the qualitative, but not to the quantitative separation. In Chapter VI, Sonnenschein's process with phosphomolybdic acid is stated to be the best for the isolation of poisonous alkaloids; we recognize the value of the reagent and its usefulness for the detection of alkaloids, but we doubt the correctness of such a sweeping assertion.

A large field is covered by the work before us. In addition to the subjects already mentioned, it treats of the recognition of pharmacopœial salts, the systematic qualitative analysis of salts, the detection of alkaloids, toxicological and volumetric analysis, ultimate organic analysis and of special processes, including urinary analysis.

From what has been said above, it is readily seen that we regard the book as a suitable one to be placed into the hands of the advanced student, whom it will serve as a useful guide in analytical work.

Review of the Drug Trade of New York for the year 1882. Prepared by D. C. Robbins, Esq., for the Twenty-fifth Annual Report of the Chamber of Commerce of the State of New York. 1883. 8vo, pp. 12.

A considerable portion of this report is taken up with the supply of cinchona bark and quinine in the European and American markets, the causes of the present low price of quinine and the uncertain prospects of its manufacture in this country. The importation of quinine has more than trebled since 1879, reaching 794,495 ounces in the fiscal year 1881–1882, while in the same period the importation of cinchona bark has decreased over one and a third million pounds, being during the last year a little over five million pounds. The imports of opium were lower than in any

year since 1877 with the exception of 1878; on the other hand the quantity of opium prepared for smoking has rapidly increased, and reached during the last fiscal year the unprecedented quantity of 106,221 pounds, an increase of nearly 30,000 pounds over the preceding year. But slight variations are observed in the importation of such staple articles like ammoninum chloride, argols, gum arabic, camphor, potassium chlorate, potassium nitrate, liquorice, cloves, pepper and others, while an erratic variation in the quantities annually imported is noticed in vanilla, asafetida, squill, colombo, senna, catechu, mercury, indigo and a number of other articles.

Auszug aus dem Zolltarife für Producte der chemischen und verwandten Industrie von Amerika, dem Deutschen Zollgebiete, England, Frankreich, Italien, Oesterreich-Ungarn, Russland und der Schweiz. Cöthen 1883. 8vo, pp. 19.

Abstract from the customs tariff, for products of the chemical and allied industries of the United States, Germany, England, France, Italy, Austria-Hungary, Russia and Switzerland.

These interesting tables have been carefully compiled by Dr. G. Krause, editor of the "Chemiker Zeitung." Since by recent legislation the duties on many articles of commerce have been changed in the United States, many of the statements relating to this country, necessarily apply to the past.

The Untoward Effects of Drugs. A pharmacological and clinical manual. By Dr. L. Levin, Docent of materia medica, hygiene, and public health, in the University of Berlin. Second edition, revised and enlarged. Translated by J. J Mulheron, M.D., Professor of principles of medicine, materia medica, and therapeutics, in the Michigan College of Medicine. Detroit: Geo. S. Davis, 1883. 8vo, pp. 220. Price $2.

The action of medicines is determined by observations made either experimentally in the laboratory, or by experience at the bedside; the mean results of such observations constitute the typical or normal action of the drugs. Occasionally, however, the action differs more or less essentially from that expected, and though such cases have been frequently reported, the records are mostly not readily accessible, and are frequently but superficially considered. The author has, for this reason, patiently collected these scattered facts, and has added his own observations, which labor resulted in the publication, two years ago, of a work in German, entitled "Die Nebenwirkungen der Arzneimittel." The translation has been made with the author's consent, who has also furnished copious additions, so that the book now before us is virtually a second and revised edition.

The drugs are classified according to their general effects as tonics, astringents, alteratives, etc., and in each case reference is made to the literature. The translation has been well made, and this in connection with the importance of the subject, will secure for the book the attention which it merits.

Proceedings of the New Hampshire Pharmaceutical Association at the

Ninth Annual Meeting, held in the City of Concord, October 17, 1882. 8vo, pp. 52.

The officers for the current year are: Elias S. Russell, Nashua, President; George E. Gordon, Suncook, and Stephen F. Sanderson, Rochester, Vice Presidents; George F. Underhill, Concord, Secretary; H. B. Foster, Concord, Treasurer; J. O. Burbank, Manchester, Auditor; and William P. Underhill, Concord, Reporter on the "Progress of Pharmacy." The next meeting will again be held in Concord, at such a date as the Executive Committee may appoint.

Englisches Conversations Buch für Pharmaceuten. Von Dr. Th. D. Barry, Berlin: Julius Springer, 1863. 12mo, pp. 50. Price 1 mark.

English Conversation Book for Pharmacists.

This little book is intended for German-speaking pharmacists in Europe, to facilitate their intercourse with tourists speaking the English tongue. The author has evidently endeavored to confine himself to such articles which are most generally in demand by travelers, and to omit such drugs and preparations, the English name of which corresponds nearly with the Latin pharmaceutical name, though this rule has not been strictly followed; thus for instance, paregoric and ipecac are omitted, while tartar emetic and spermaceti are mentioned. Hellebore is translated rhizoma veratri, which on the continent of Europe refers to veratrum album, and this is always popularly designated as *white* hellebore. By *snake root* serpentaria is commonly indicated here while it is translated as senega. Santonica flowers is not a popular term; the article is generally called European or Levant worm seed. The little book contains also a few brief dialogues, a list of Latin abbreviations, sometimes used in English, but rarely in American prescriptions, etc.

Transactions of the Twenty-ninth Annual Meeting of the Medical Society of North Carolina and Conjoint Session of the North Carolina Board of Health, held in Concord, May 9–11, 1882. 8vo, pp. 270.

The Importance of Chemistry to Pharmacy and the Necessity of a Thorough Knowledge of Analytical Chemistry to the Pharmacologist. An address delivered to the graduating class of 1883, Pittsburgh College of Pharmacy, by E. A. Wood, M.D.

Second Triennial Report of the Pharmacy Board of Victoria, Melbourne, 1883.

Fortieth Annual Report of the Managers of the State Lunatic Asylum at Utica, for the year 1882. Transmitted to the Legislature January 10, 1883. Albany: Weed, Parsons & Co. 8vo, pp. 103.

Trichinæ, their Microscopy, Development, Death, and the Diagnosis and Treatment of Trichinosis. By W. C. W. Glazier, M.D., Assistant Surgeon Marine Hospital Service. Illustrated with 17 wood cuts. Detroit: Illustrated Medical Journal Co., 8vo, pp. 20. Price 25 cents.